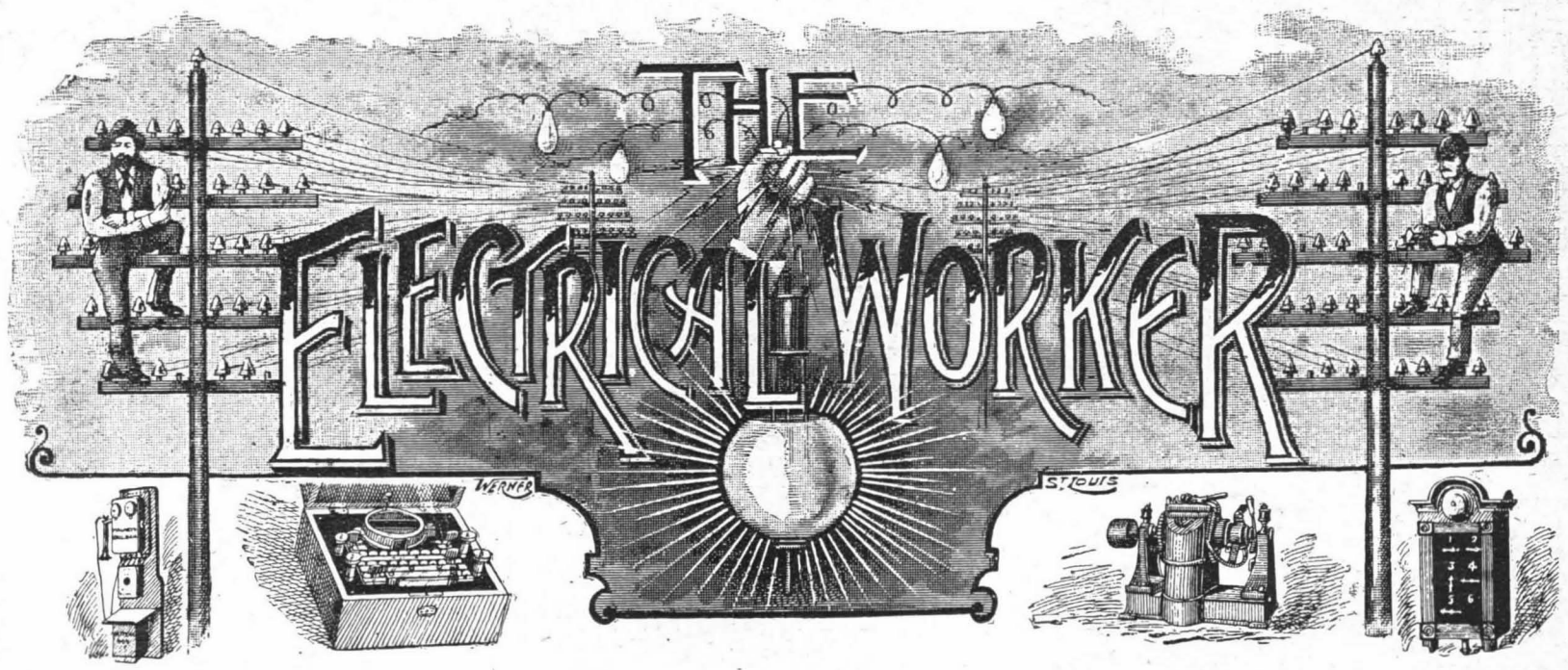
MAY 1893 A-1

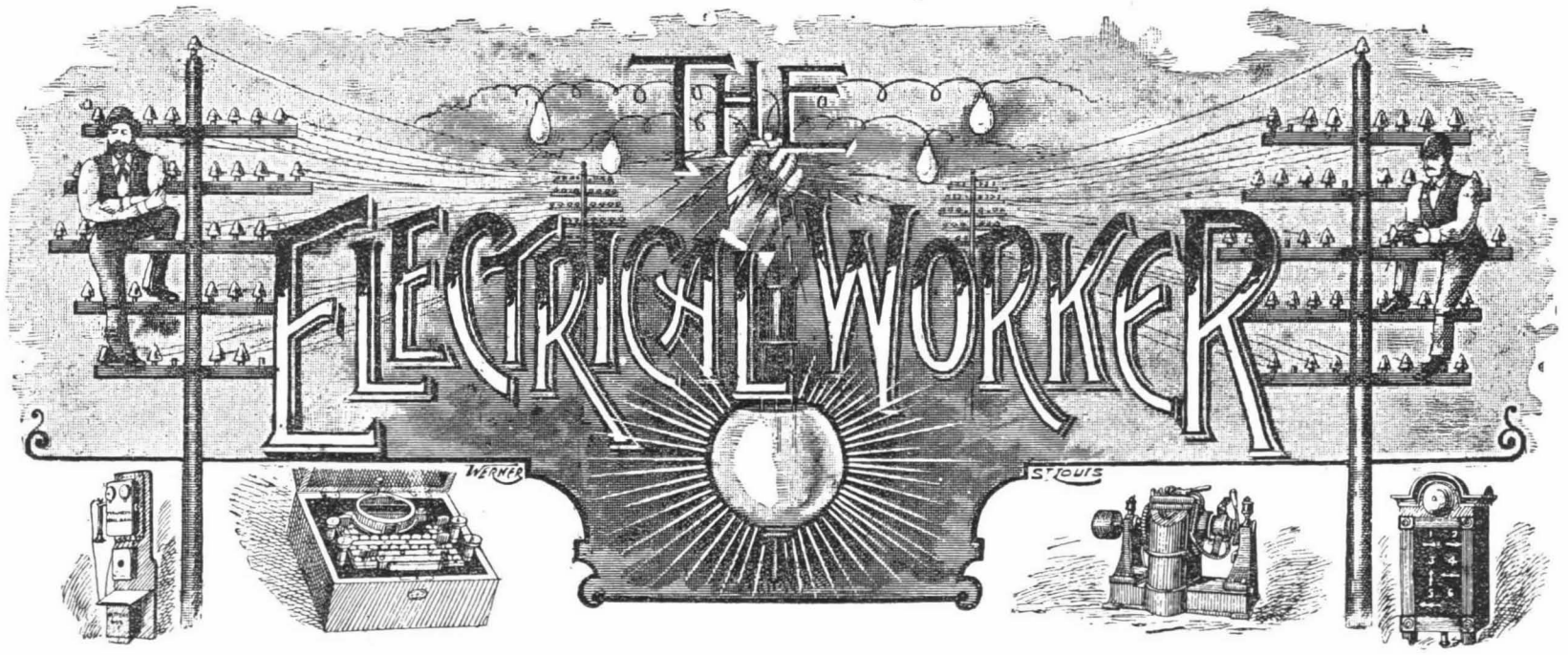


Official Journal of the National Brotherhood Electrical Workers of America.

VOL. 1. ST. LOUIS, MAY, 1893. No. 5.

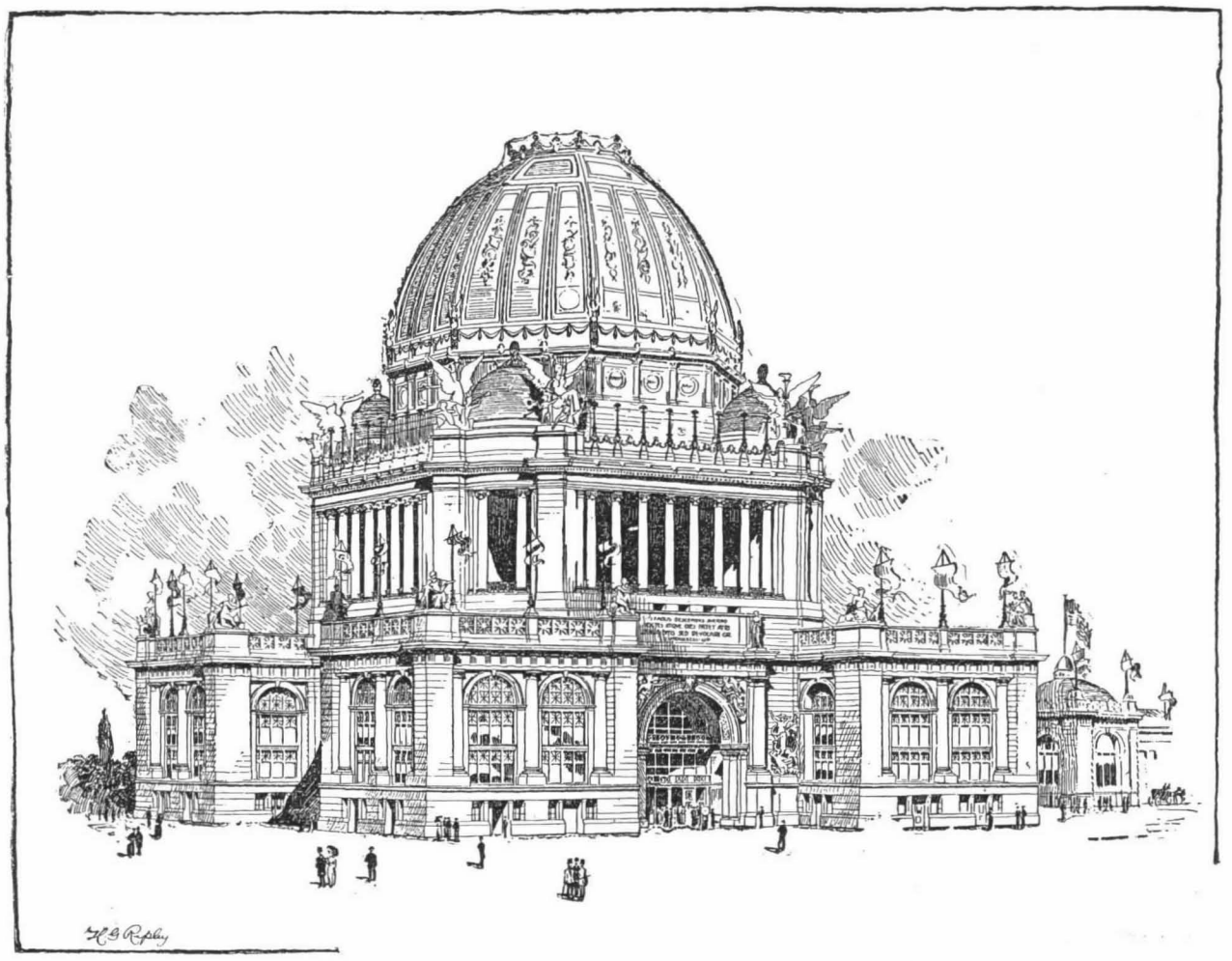
MAY 1893 P. A2

MAY 1893 P.1



Official Journal of the National Brotherhood Electrical Workers of America.

VOL. 1. No. 5. ST. LOUIS, MAY, 1893. PER YEAR, $1.00 IN ADVANCE. SINGLE COPIES, 10 CENTS.



THE ADMINISTRATION BUILDING—WORLD'S FAIR.

By popular verdict the Administration Building is pronounced the gem and crown of the Exposition palaces. It is located at the west end of the great court in the southern part of the site, looking eastward, and at its rear are the transportation facilities and depots. The most conspicuous object which will attract the gaze of the visitors on reaching the ground is the gilded dome of this lofty building. This imposing edifice cost about $450,000. It covers an area of 260 feet square and consists of four pavilions of 84 feet square, one at each of the four angles of the square, and connected by a great central dome 120 feet in diameter and 220 feet in height, leaving at the center of each facade a recess of 82 feet wide, within which are the grand entrances to the building. The general design is in the style of the French renaissance. The first great story is the Doric order, of heroic proportions, surrounded by a lofty balustrade and having the great tiers of the angle of each pavilion crowned with sculpture. The second story, with its lofty and spacious colonnade, is of the Ionic order.

The four great entrances, one on each side of the building, are 50 feet wide and 50 feet high, deeply recessed and covered by semi-circular arched vaults, richly coffered. In the rear of these arches are the entrance doors, and above them great screens of glass, giving light to the central rotunda. Across the face of these screens, at the level of the office floor, are the galleries of communication between the different pavilions.

The interior features of this great building even exceed in beauty and splendor those of the exterior. Between every two of the grand entrances, and connecting the intervening pavilion with the great rotunda, is a hall or loggia 30 feet square, giving access to the offices and provided with broad circular stairways and swift running elevators.

May 1893

THE RELATIONS BETWEEN THE ELECTRICAL AND INSURANCE INTERESTS.

[A paper by James A. Wentworth, President St. Louis Board of Fire Underwriters, read before the Electric Club of St. Louis, April 15th, 1893.]

Self-preservation is the first law of life; it is the first law of corporate and business life as well as of natural life. Like all the laws of life, it is reasonable and just. In any inquiry into the relations of living things it must be recognized and admitted to be the foundation principle. Every living being, natural or corporate, is instinct with this principle of self-preservation, and when that instinct shall cease it shall die.

But there is no solitary law of well being. This prime law is not the sole law. Were it the sole law, men would become Ismaelitish—their hands against every man. The unmodified operation of this first, absolute, invariable, essential law of life would be the destruction of life and of society. There are other laws, equal to and concurrent with this first law, which govern all living beings and all human interests. We must look further to what may be called the laws of comity—of association—of the capacity to live and thrive together—for the laws which govern living men and the interests of living men, whether social or business.

In addressing you on the relations between electrical and fire Insurance interests, I speak as the local representative of one species of invested capital addressing the representatives of another species of invested capital. The genus is the same only the species differ. The two interests are free and equal. They are subject to the same fundamental laws, governed by the same principles, operated under the same necessary conditions. With both self-preservation is the first law. The permanent prosperity of both, however, depends also on observing the laws of comity with all their kind. This is the broad general relation they hold to each other, and to every species of invested capital—the relation of independent life and interdependent prosperity. Invested capital can not escape from the mutuality of the relation; it can not violate it in any of its forms and prosper for any length of time.

To come down from general principles to the personal relations of the two interests at that point where the practical details of electrical work meet the practical details of insurance, the point of contact and of friction, let us examine the two interests. They are free; each has its own special field; neither is in any wise subordinate to the other; each is possessed of the inalienable right of self-preservation. And yet they are not independent of each other. There is a common ground on which they are compelled to meet and act; a point at which there is a common interest and at which they can mutually serve or mutually injure each other. At this point the solitary law of self preservation is inadequate, and, if alone, would breed strife and loss. At this point, as on every common ground of human action, the law of comity—the law under which men agree to live and thrive together—furnishes the basis of their mutual relations, and accordingly as they occupy this ground intelligently and peaceably, in like proportion will they occupy it successfully. Let us look at this common ground of operation for a moment. In doing so I will speak only of what I know, and of that of which I have been a part.

It is the lot of fire insurance to pay for all the improvements and experiments. Till the refining of petroleum had developed a burning fluid of reasonable safety, the insurance companies paid millions for fires set by exploding lamps; when flouring mills were changing the roller process, the companies paid for most of the old mills and old machinery; when sugar refineries got ready to change their process and their machinery the companies paid for refinery after refinery till half the refineries of the country were gone. So with every old plant while being shut out by a new process, so with every new invention while it is being introduced by tyros and installed by unskilled labor; the fire insurance companies pay for the experimenting. This does not appear to be quite right; nevertheless, public opinion seems to be agreed that this class of losses, due mainly to ignorance and incompetence, should be charged up to insurance. Insurance is a cenvenient fund and honors most of the drafts made upon it. If it hesitate, it is helped to a decision by a jury of its countrymen. It has been the greatest aid to progress the world has ever known, and has paid hundreds of millions to keep the industries of this country abreast of the times. It is a great, if involuntary, benefactor; but it can hardly be wondered at if under the circumstances the instinct of self preservation is powerfully developed in the insurance interests.

Electricity was the latest novelty that presented itself to the conservative eye of insurance. The new comer did not make a favorable impression. It was a new and ubiquitous force; it was reported by its best friends to be erratic, whimsical and even dangerous. It was known it would burn, it was said it would kill, it was believed that nobody knew much about it. It was popularly supposed that it took a conjunction of chemist and civil engineer to wire a building so that life and property would be safe. The coming king stepped on the stage with the reputation of an incendiary and an anarchist. He claimed the right to enter every house and bring his incendiary habits with him. It was claimed he could be permitted to enter and remain in a building with reasonable safety if—and here the electrical interests and the insurance interests met. Who was to decide under what conditions electricity could be introduced into our warehouses, factories and homes with reasonable security against setting the town on fire? Electricity brought with it a motley multitude of hangers-on and a foreign nomenclature. A new class of men known as experts seemed to spring like an exhalation out of all sorts of occupations—out of tinners' shops and plumbers' stores and out of boiler and engine rooms. These men knew nothing about electricity, but they soon learned to patter about volts and amperes and short circuits, and they paralyzed the boldest citizen with these and such like cabalistic expressions. They spoke with authority and claimed the right to decide what was safe and what was unsafe. In 1888 it took about three weeks to convert a mechanic into an electrical expert. The sudden growth of expert talent beat the record of Jonah's gourd. By a merciful dispensation the worm was ready and the expert fungus perished as it had come—in a night. But while these men were contracting and doing work you may readily suppose they did not commend electricity to insurance companies as a harmless innovation. Some of the work done by them would make your hair stand on end. It is being condemned and taken out wherever found, often at great cost.

The insurance agent is rarely more than ten years in advance of the community in scientific matters, and I confess that he didn't know a bit more about electricity than the electrical expert. He wasn't so much scared by the electricity as he was by the expert talent. The insurance companies were scared, however. Whatever else they might or might not know about electricity they knew they had to pay for it. They were right; they paid at once for the first central station in St. Louis—the Brush on Walnut Street—and then they were sure that electricity was an incendiary of the first order. Do you blame them? I think that at that time, omitting a few men of technical education, there wasn't a man or boy, not even an insurance agent in St. Louis. that knew anything definite or practically useful about electricity; and much of the installation at that time was done by ignorant and incompetent men. That was the situation in the beginning, and I think the insurance companies were justified in keeping the law and practice of self-preservation well to the front. I am also free to say that I believe the situation in St. Louis was practically the situation in every city and town in the United States at the first introduction of the great modern power; it was in grossly incompetent hands. Everywhere throughout the country property was being burned by imperfect electrical work. Self-preservation was the only law for the insurance interests for quite a little while until matters adjusted themselves. And the moment was opportune for invoking this fundamental law in their own behalf, in St. Louis at least. There was a well-organized board in active working order, with power to exact a reasonable or even a large tax for this new and undoubted hazard which was being forced upon them—for it was then a hazard beyond dispute. Such a tax would have been levied with public approbation, for the public themselves were afraid of electricity and believed that it was a serious fire hazard. It is interesting to note how the board, the representative of the insurance interests, behaved at this juncture, and what the relations were which it established between itself and the electrical interests when it had the power to determine them for the time being.

I assert this for the insurance interests in St. Louis, that at this juncture they did not claim to know any more than they did actually know about electricity. With every temptation to do it, they did not set themselves up as dictators to the electrical interests or take any advantage of the situation. From the start they clearly recognized and admitted, first, that they were face to face with the coming motive and illuminating power; second, that the electrical interest was clothed as fully as themselves with the instinct and right of self-preservation, and third, that the law of comity or profitable living and working together was the only law fairly applicable to the situation. There is no charge or tax proposed or approved, recorded on the minutes of the board for the use of electricity either as light or motive power, under ordinary conditions of safety. There is no evidence of any assumption of superior knowledge on the part of the board or of setting up as an instructor or dictator. The first set of rules governing electric installations was presented and recommended by a St. Louis electrician, who urged their adoption in the interests of the electrical business in St. Louis, and to restrain the conscienceless competition of ignorant and incompetent contractors. They were adopted for the mutual benefit of both interests, and the board set their best inspector to work to educate himself sufficiently to inspect the work done under the rules. These rules have been amended since by the joint action of insurance companies and electricians—your own body passing on the last edition. What has been attained in the last six years in perfection and safety of installation, in intelligence and competency of inspection, we have grown up to; we have educated ourselves up to; we have moved thereto with equal step. There is no place for the claims of small precedences in this business. The more scientific we are the humbler we shall surely be, for we know—and if we don't know, our neighbors will remind us—from what depths of ignorance and with what painful effort we have climbed to the small eminence on which we stand, appropriating the discoveries of the very great investigators as fast as made, and growing great on what we fed on. On the score of knowledge, therefore, or of authority to speak, let us claim for ourselves a precedence of modesty. Our relations ought not to suffer from this cause.

A prominent consideration determining the relations of the two interests is the authority, assumed or conceded, of making inspections. This may easily be made a ground of dissatisfaction and strained relations. But a little common sense will, I think, settle this matter. That inspection and control of electric installation is necessary and desirable and beneficial to all parties, I think there can be little doubt. It is certainly necessary for the insurance interests, which have to pay for all the losses caused by its dangerous defects; it

May 1893

is necessary for the electrical interests if the conscientious contractor is to have a show, and if the credit of the business and the public confidence in its safety are to be maintained; it is necessary for the Light and Power Companies, who need some test of the installations they supply, quite as much as the gas companies require a test of the gas pipes and fixtures they fill; and it is necessary for the public that it may quietly and securely enjoy the great modern boon of electric light and power. There may be and there is a question where this power of inspection and approval shall reside, with insurance, with electricians, or with the public. As the greatest disaster in case of dangerous defects falls upon the insurance interests; as they are never quit of the risk, while the contractor is discharged of liability on payment of his bills, and as the absence of the stimulus of direct personal interest tends to make the public official inspection superficial, the duty seems to have been wisely assumed by the insurance interest. It has most at stake. It would probably inspect on its own behalf in any case. If the general inspection be honestly administered to the benefit of all parties by this outside interest, which seeks only safety of installation, it is undoubtedly better to have it done by it and to pay for having it done. As far as I am able to learn, there is no serious ground of complaint against inspection as at present conducted. Its rules and prices have been mutually agreed on, and the enforcement of the requirements has not been offensively made. The fruits of co-operating relations between the electrical and insurance interests in St. Louis are to be found in every hand. They are to be found first and chiefest in the ability to secure the installation of any plant in the safest and most approved manner by harmonious action between us; second, in the fact which I think is apparent that St. Louis is the best wired and best fitted city in the United States, and third, is not this association itself, and this meeting, one of the fruits of harmonious relations? The survival of the best and strongest elements in the electrical business; the dying out of the mushroom expert, and the training and education of the men who had the mental and moral powers fitting them to live; all this, I think, is attributable in part to the high standard of requirements adopted for electrical work and the harmonious relations that secured its application. A curious proof of the thorough-going nature of the inspections in St. Louis was furnished in connection with a job done by a Chicago contractor in one of our largest stores. The requirements were well understood, and the understanding was positive that the concealed work was not to be covered up till it was inspected. But the inspector found the concealed work boxed up and the walls painted and decorated in fine style before the work had been inspected. The certificate was refused. The opening was to take place in a day or two. No threats nor objurgations of the Chicago man, who had never heard of such a high-handed proceeding in his life, nor even the entreaty of the merchant, the beauty of whose opening would be materially marred by tearing open the walls, could extort the certificate. We induced the merchant to stand firm and refuse payment till the certificate should be issued. The contractor was brought back from Chicago, the boxing stripped off and an incomplete, unsafe and skamped job stood revealed. It cost the fellow three days' work to make it right. When he got his certificate he swore he would not work in the —— town for $500 a month.

That was a high compliment to our system; it is so good a Chicago man couldn't live under it; it was a tribute also to the way electrical work is done under the system of mutual co-operation in St. Louis.

Whether electricity is a fire hazard when installed with all safeguards science can suggest, is a question on which the two interests may not always agree; but I will say that in practice it has been decided in St. Louis in favor of the subtle fluid, which is admitted as an illuminator and as a power without charge for it as such. This would seem to remove the matter from the ground of a vexed question, and free the discussion of our relations from that issue. Undoubtedly from the insurance point of view the accumulation of many new and intense potencies both of light and power and material—electricity among the rest—is forcing up the loss ratio of the country and slowly increasing the rates of insurance. There is none of us wise enough to put his finger on the amount, proportion or nature of this increase of the fire loss due to the universal use of electricity. Personally, I believe that in all its uses when properly installed, it is an improvement over that which it has displaced. The sum of all these influences is one of the marks and comcomitants of our present progress and it would be more profitable to adjust ourselves to it than to protest against it. On this score insurance stands in precisely the same relation to the electrical interests that it does to all other interests and elements which enter into and create our fiery experience. We may know something about this later on, but at present it is not a question which is sufficiently advanced to justify any positive dictum. The harmonious relations of these two interests should not be prejudiced by dogmatizing on that subject.

I am not competent even at this late day to talk electric talk to you, nor would I attempt it in this presence if I were. I know much less about electricity than I knew I knew five years ago. Probably some of you have had the same experience. It offers the vastest and richest field now open to human investigation; in its unexplored tracts it contains the largest elements of power, the mightiest factors of material prosperity, convenience, comfort and civilization left for the enjoyment of the last ages; in its domain man will achieve wonders of discovery and by its aid exhibit marvels of power beside which all that the puny past can show will shrink into insignificance. The world will become a neighborhood and the unity of the race will be accomplished. Into these things I can not expect to enter save by faith and reasonable expectation. But I can, from the height on which we now stand and with the prospect now within our ken, see enough to justify me in protesting against the paltry and narrow suggestion that, for any vain dream of temporary advantage or visionary profit, it would be wise or necessary that the great interests under consideration should adopt the law of self-preservation as the sole rule to govern their relations towards each other, and abandon that higher law of comity and mutual help under which they have hitherto lived and thriven together.

A plant for transmittting power by electricity has been in operation for five months in California and is of more than ordinary interest. The generating plant is placed at a point on the San Antonio River fourteen miles from Pomona and twenty-eight miles from San Bernardino. Here water shoots down a line of pipe under a head of over 400 feet, and is discharged against the blades of a Pelton water wheel with a pressure of about 200 pounds per square inch. The power thus obtained is used to drive the dynamos at a speed of 600 revolutions per minute, furnishing an alternating current of 1000 volts to a set of transmitters which increase the pressure to 10,000 volts, the highest used in any commercial plant. At this pressure the current is transmitted over two bare copper wire circuits to Pomona and San Bernardino, where reducing transformers let down the voltage to a pressure which may be safely distributed in an inhabited district. This plant has been running for five months with but one accident, which was not due to faulty electrical construction, but to a flaw in the pipes conducting the water to the generating system.

TELL me, is this life to be called merely a brief and worthless fact when, by a little reading, for instance, I can make the experience of other men and lands and ages all mine.—[E. H. Chapin.

IT takes a great deal of grace to be able to bear praise. Censure seldom does us much hurt. A man struggles up against slander, and the discouragement which comes of it may not be an unmixed evil; but praise soon suggests pride, and is, therefore, not an unmixed good.—[Spurgeon.

Electrical Development.

The growth in electricity has been marvelous, incredible to one who has not gone along with it. Twenty-three years ago there were only five books on electricity in the United States, to-day an ordinary expert's library numbers a thousand. The telephone of ten years ago bows to the photophone, for the scientists are now talking with each other along a beam of light—a few hundred feet to-day, a few hundred miles to-morrow. Telegraphing has been done without wires and has been proved practical. By induction the message is now sent from a moving train, or an electric lamp is kept burning while being carried by hand around a house and from room to room. An inexhaustible store of energy, which may be used without generation or transmission has been found and its use at small cost is the problem now being solved.

The earth has been proved to be a "dynamo," generating electricity by its revolution before the great magnet—the sun. The bold suggestion of ten years ago that it might be a thermopile has been shown to have been too modest. The problem now is how to take to take the electricity directly from it, to make it the storage battery for all material force of every kind necessary in labor and have it as free to the manufactures who owns the machinery as the air and sunlight to the agriculturist.

Electricity was not "practical" until it could be fed on coal instead of zinc; until a pound of coal produced one horse-power per five minutes. It has in ten years almost reached one horse-power per hour. In the past five years it has been applied to 40 per cent of the street railways of the country. In factories, in mines, in mills, in metal working, wherever drudgery is to be done or force exerted, the new servant does better and cheaper work than the old. It is used in place of dynamite even for blasting rocks, and the "dot brush" now gives light and heat without consuming any material—reproducing the sun and explaining its nature.

The inventions and applications in the electric field are too many to even tally. Ten patents are granted daily, a hundred new applications are made hourly. Ten years ago the electric plants in the United States numbered thirty-nine, with a capital of $1,299,300, employing 549 persons. To-day the plants in the United States number 3000, having $700,000,000 capital invested and 623,000 people engaged in the work. It has increased in ten years a thousand-fold here and we are not ahead of other civilized countries. But this is as nothing to the future progress, when the Welsh "converter," by which a feeble current can be raised to an enormous voltage, and a Grove battery actually emptied in a minute, are surrendered to commercial uses. The "transformers" are now in use, and by them a current can be carried over a hundred miles with a loss of but 28 per cent. As the power producing the current costs nothing usually, as in the first power-house established at the water fall of Lauffen-on-the-Neckrr, this loss is of little moment; but here in New York Harbor an iron hulk in the salt water of the bay has been used to light and heat a house on shore. The faint current running through the wire, felt only by a Thompson's galvanometer, was sufficient when passed through converters to show a voltage of 120. The dynamo may have, after all, but a brief reign. Gothenburg, supplied with electric power from the Falls of Trollhatta, set an example which twelve other towns have followed, and Niagara Falls will soon cease to be anything but a natural force owned by a private corporation and sold to the public at voltage rates. It is a race between the transformer and the converter.—*T. E. Wilson in N. Y. World.*

An Electrical Bicycle Railroad.

A novel experiment is about to be tried on Long Island, some fifty miles from New York. A bicycle road operated by steam has been running for the last three years to the satisfaction of its projectors, between Gravesend and Coney Island, and it is now proposed to increase the effectiveness of the system by the use of electricity. For this purpose a track of a mile and a half has been constructed. A special motor is to be used with a driving-wheel 5 feet. This combination should give a speed of one and four-fifth miles per minute, but it is understood that no such speed will be attempted. It is announced, however, that when the road between Batchogue and Brooklyn is completed a speed of 100 miles an hour will be attained. The question of track adhesion would seem to be the greatest one involved in the proposed rapid-transit scheme, and if it is overcome the chances of success from an engineering standpoint are promising.

THERE are many ways of being frivolous, only one way of being intellectually great; that is honest labor.—[Sidney Smith.

MAY 1893

Electric Display at Worlds' Fair.

Tired of waiting for the favor of his solar majesty, weary of looking in vein for the bright rays from above that do not come, the resistless energy of the White City has concluded to make its own sunlight and bid defiance to the monarch of the skies. Last night's scene in Jackson Park was strongly suggestive of more than finite power. Gathering himself for a mighty effort, man marshaled his hosts of dynamos and lamps and produced orbs which rivaled the sun, the moon and stars in beauty and brilliancy. It was a literal turning of night into day, save that the day was filled with new colors and effects which nature never attempts save in the rainbows which she hoists athwart the heavens as the storm departs.

The prismatic fountains at the end of the central court were last night rainbows of great promise. They cast their quickly varying hues over a magic city that has unquestionably been in the dumps. They disclosed the presence of a multitude of spectators attracted by a scene which no pen or brush will ever describe, but whose fame will travel through the land and attract mulitudes upon multitudes. They displayed the palaces of the white city in new tones, and gave to every beholder new confidence in their ultimate conquest of all opposing forces of time, distance, element or finances.

Late in the afternoon the number of visitors to the World's Fair began to increase rapidly. By all means of transportation crowds came to the grounds to enjoy an hour's visit to the building in which they were most interested, followed by a dinner at twilight, with the electric launches gliding noiselessly beneath the windows of the restaurant and the gondolas passing by like a dream of Venice. Seemingly conscious of the rival illumination to follow the sun in the hour of its exit executed numerous beautiful feats of coloring on the walls of the White City, and as it left the scene to its artificial successor, sinking behind a screen of war-tinted clouds, there was an hour of anticipation followed by a triumphal entry of the illumination prepared by the electricians.

Just as the first stars came out under a mistaken idea that it was their right to shine, the Administration building put on its jewels and the crowd around the plaza saw a building beautiful as a fairy tale. Encircling the cornice was a band of lights joined to which were strands sparkling with electric gems which lighted the building from dome to cornice, crowned with light.

The search lights were late in getting out their rays, but they were piercing when they came. When turned on to the Wooded Island it gave little peace to cooing lovers. Only one search light was run and that was on the proper side to do the wooded island justice.

In the Electricity Building there were several electric devices to amuse the public. In the center of the Western Electric Company's display a big pillar is wound thick with incandescent globes. The arrangement was such that the great light began from the bottom and crept upward. Reaching the roof it turned off on four lines of lights in a zig-zag course, finally disappearing in a whirling ball of light of many colors. This show was very effective.

The Bell Telephone Company had an office in running order in this building and it was visited by hundreds.

The big electroliers in the Manufactures' Building were not all running, but enough to make the hall very light. Columbia avenue, as this midway street in the big pile is called, is probably the best lighted street in the world. The big chandeliers hang thick with lights of the arc variety, such as are used in the streets. Each electrolier has about seventy of them and there are seven electroliers.

Surrounding the dome of the building was a cluster of brilliant arc lights, fit crown for the queen of White City architecture. Inside the building the spacious rotunda was illuminated to a noonday degree of brightness by clusters of lamps encircling the dome at the heighth of the first balcony and also by hundreds of lamps on the ground floor, arranged so they looked like electrical shrubbery. Hundreds of promenaders strolled around the Administration Building rotunda, while thousands gathered on the plaza outside and reveled in the feast of sight and sound, the illumination and the music. On one end of the plaza the Iowa State band played a programme of popular music. At the other end was the Cincinnati band, and between the two the air was full of melody. A fleet of electric launches and gondolas circled around the basin, the masonry-formed shores of which were a necklace of electric lights.

People talk of figures as prosy characters. But after all it is only by dimensions, lengths, heights and breadths that the mind can properly understand and realize great undertakings. When one comes to think of the miles, and feet, and inches, and acres of detail necessary to make this stupendous whole, then one begins to know something of the undertaking, one begins to wonder and marvel. Take the matter of electrical illumination of the grounds and buildings, for example:

Arc lamps in Manufactures' Building, 1200; in Agricultural Building and annex, 500; in Transportation Building proper, 350; in Horticultural Building, 250; in Mines and Mining Building, 200; in Machinery Hall, 250; in Fisheries, 50; in Illinois State Building, 77; total arc lights in main building, 2877.

This does not take into consideration any lights on the grounds, or any of the lights which will be used by individual exhibitors. Nor does it include any of the incandescent illuminations. R. H. Pierce, Chief Electrical Engineer, has furnished considerable information on the subject. He said that the contract with the Westinghouse Electric and Manufacturing Company for incandescent lighting called for the furnishing of dynamos, feeder and converter capacity for 83,410 lamps of 16-candle power, and 6212 lamps of 19-candle power, or a tottal of 89,622 lamps; and inside wiring, or wiring to lamps, of 50,410 lamps of 16-candle power, and 6212 iamps of 10-candle power, or a total of 55,622 lamps.

To supply these there is a subway system or main trunk line in the grounds of 76,000 feet of duct, and in the whole duct system there are over 250,000 feet of duct. The main subway contains about twenty-five miles of feeders, and the ducts carry over forty miles of duplex cable. Departing from details for a moment, it is found that this system is for the accommodation, health and comfort of 750,000 visitors and 100,000 exhibitors and their employes. The piping necessary to do this would maintain the sanitary condition of a city of a half million inhabitants.

Some evening this coming season, as the visitor will roam about the grounds and see the expansive illuminations, the glowing domes, the sparkling lights on the wooded island, the clusters along the driveways and walks, he will no doubt sit down after his jaunt and wonder how all was done. Supposing that he should present himself to the chief engineer, and that the chief should have time to go with him over the course; here is what he would see:

Beginning at Machinery Hall he would go into a subway or tunnel, and find himself walking upright in a lighted passage which is nearly square; there is above no imitation of an arch. The subway is brilliantly lighted by electricity. He would walk on to Electricity Building or to the Mines and Mining Building; he would come out at the bridge west of the Manufactures' Building and pass over the bridge; if he should pass under it he would see how the wires are fastened under it, and following the labyrinth he would again descend into the earth on the other side and enter another subway like the one he left. This runs along the entire west line of Manufactures' Building, 1700 feet; the distance from the bridge to the west line is 300 feet; the subway continues under the north portico of the Manufactures' Building, stops, crosses the bridge to the north as it crossed on the other bridge, and then begins again underground and runs over to the Fisheries and the Government Buildings, where it stops. The entire way is lighted with sixteen-candle power 100 volt incandescent lamps, placed in series across a section of the 500 volt power circuit wires that are attached by glass insulators to the ceiling. The subway is double, and each section is the same in size and appearance, that is, six feet six inches square, built of two-inch tarred planking spiked to three by eight inch timbers set twelve inches apart, and made fireproof by an inch coating of cement held in position by expanded metal lathing. The capacity is far in excess, the traveler would be told, of any possible demand, and 240 large wires are supported on glass insulators in both main sections, while provision is made for supporting in addition, telephone and fire alarm service cables containing innumerable circuits. Connections with this subway and its branches are made with the main buildings through trap-doors, and along the line by 1500 manholes. Also connecting with it directly and indirectly are nearly ninety-three miles of six-inch "pump logs" placed in trenches. These accommodate telephone and telegraph lines for fire alarm purposes.

For the electric power circuits in this subway, conductors with a capacity of 200,000 feet of wire were laid. For fire alarm and police signal service, 350,000; for the telephone circuits, cables for main distributors equivalent to 750,000 feet of metallic circuit have been furnished; for branch conductors, 100,000 feet of wire and insulation, each wire being separately braided and the two twisted together for the arc light circuits 264 miles of copper conductor, and for the incandescent circuit several hundred miles of Grimshaw wires; and of smaller Grimshaw wires several million feet will be used in the buildings, while a half million feet of larger size will be used for main feeder.

The lights along the roadways and the numerous steady glows over on the wooded island will have attracted the attention of the visitor in his walks and rests; likewise the illumination of the domes. Before he inquires into them he will go over to the place from where he started on his journey through the subway, Machinery Hall, that palace of mechanic arts. He will have learned that it has a floor space equal to twenty-six acres. Seven acres of this space have been given over to the power plant, the lungs of all the light and the brain of all the illuminations he has seen. There it is: An immense engine belted to two equally immense dynamos. The engine drives direct two 10,000-light Westinghouse alternators from one main thirty-foot driving pulley.

It is from this plant that the buildings already enumerated are lighted. The plant is the solar center of the Exposition. From the building in which it is starts the big subway already described, and in the latter are the circuits by which the thoroughfares, buildings, the wooded island and pathways are made as plain as the daylight could make them. Now return to the plant.

Two seventy-two inch belts, one over the other, transmit the power to the nine-foot pulleys of the dynamos. Although this engine is not so conspicuous as to dwarf the surrounding machines, it is in reality capable of developing 2500 horse-power, while the big engine at the Centennial was only rated at 1500 horse-power. In adjoining blocks are ten 10,000-light alternating current machines driven by ten 1000 horse-power engines, while two 4000-light alternators and the necessary exciters are driven by engines of lesser capacity. The twelve 10,000-light machines are all of the same pattern and furnish a current of 2000 volts. The total capacity of these fourteen Westinghouse machines aggregates 158,000 sixteen-candle power lamps.

The equivalent of 25,000 horse-power in steam will be generated in the boiler plant which adjoins the power-plant building. It must be that by this time the visitor will have obtained some idea of the magnitude of the system which has held his attention. He is now prepared to resume his walk.

The arc lights, which show him where to go are 1550 in number, and are placed for sixty-five to seventy-five feet apart in the central portions of the grounds. The entrances to the Art Gallery are lighted by these arc lights. The dome of Administration Building, which, he will bear in mind, is greater than the dome of the Capitol at Washington, is lighted by the incandescent system. In fact, all lights everywhere on the grounds have been arranged so that they will enrich the points of beauty and symmetrical decoration. Around the main entrances of the principal buildings there will be clusters of lights. Around them, on ornamental posts, will be one, two and three arc lamps, and in some cases there will be arms supporting incandescent lamps of high candle power in colored glass lanterns, which will be so effective that the man who has lolled about in the Orient will have no trouble in believing that he has been transported. Each one of these posts abuts a manhole from which the leading wires pass up through a curved, vitrified pipe into the mast and thence to the lamp connections, each alternate lamp being on some circuit. Over 10 per cent of these lamps are on the patrol circuit, which will be lighted from set of sun to the rising thereof. The lights along the high fences will be placed on tall cedar posts. In the vicinity of the main buildings the lights are placed at an equal distance therefrom of forty feet uniformly spaced on one side of the pathway. On Midway Plaisance the arc lights are set opposite each other, seventy-five feet apart. Single lamps will light all bridge approaches and a three-light cluster will be in the center of each.

It will be understood, of course, that in all the foregoing the lighting of exhibits is not taken into consideration. Nor are any of the lights necessary in the operation of Machinery Hall, so far as the power plant is concerned, considered. In other words, it does not take into consideration the lights to be given by special contract; nor to those in the annex of Transportation Building, or in Forestry Building, or in the pumping plant in Choral Hall. Many of these will be furnished by private concerns, which have already installed their dynamos for such purposes.

The decorative lighting is limited to the outlining of the main lines about the grand basin. First, the shore-line of the basin is outlined by a row of lights; next, the border of the flower beds is outlined in light; then the main cornice line of the building, extending completely around the grand basin at a uniform height of about sixty feet, is marked by a row of lights; and finally, the Administration Building is outlined in lights, each horizontal line of the architecture, the ribs of the great dome, and above all, the corona, are shown in dotted lines of light. Aside from this lighting, the use of incandescent light on exteriors has been confined to the lighting of the wooded island and the use of lights here and there to produce a soft glow in colonnades and loggias.

The two problems of lighting, by far the most

May 1893

difficult presented, have been the lighting of the Art Galleries, with the two miles of reflecting screens, and the lighting of the dome of the Administration Building. The lighting of this dome in particular is unique. On the floor of the dome, which is octagonal, there stand in the eight angles eight great spreading candelabra of special and beautiful design, each bearing fifty sixteen candle-power lamps. High up at the spring of the interior dome, is a gallery running clear around the dome. The gallery has a metal railing, and upon this railing stands fifty-six seven-light standards, forming a grand corona of light 120 feet in diameter. Far up above and through the opening in the top of the false dome is seen the beautiful painting upon the ceiling of the outer dome, as it is illuminated by a circle of arc lights which are themselves hidden from view between the two domes. For this arrangement of light the Exposition is indebted to Mr. Luther Stieringer, who has devoted himself to the study of the lighting problems at Jackson Park, and whose judgment, acquired by a lifetime of unusual experience, has always aided in their solution.

ONE FINE EFFECT.

An effective piece of lighting is seen in the Fisheries Building. The large circular pavilion upon the east is used as an aquarium. Around the building are arranged continuous concentric rows of great tanks. The sides of these tanks are of clear glass and are continued to the ceiling by stained glass screens, so that the observer walks in a covered corridor the sides of which are glass, and through which can be seen the representatives of all the finny tribes disporting themselves in their native element. At night no lights will be visible, but the tanks will be lighted by hundreds of incandescent lamps placed under screens above the tanks, so that the light does not strike the eye, but is diffused throughout the water, lighting it up as effectively as daylight.

The Terminal Station, Festival Hall and Wooded Island are lighted from a separate machine located in the German exhibit space in Machinery Hall. The Wooden Island is lighted with twenty-five candle-power incandescent lights placed in large closed shades upon short ornamental posts, and the soft lighting of the many lamps among the trees and shrubbery will form a pleasing contrast to the intense light of the arc lamps about the main buildings.

LIGHTS IN MID-AIR.

In lighting the interior of the mammoth Manufacturers' Building the plan deemed the most practicable, and which promises the best results, includes five circular electroliers or coronas, four of which are sixty feet in diameter, and the center one seventy-five feet, built of angle iron and suspended from the arches. Here the lamps are about 140 feet above the floor, and from forty to seventy feet below the roof. These electroliers are suspended by means of a steel shaft securely bolted to a bridge passing across the center of the circle, bridge and circle having a footpath nearly three feet in width, guarded by a suitable railing, along which the carbon trimmer travels when carboning the lamps, the trimmer ascending one of the big arches to the supporting shaft and then descending by means of a ladder attached to the latter. To the four smaller electroliers seventy-five arc lamps each will be suspended, and to the large centerpiece 100 arc lamps, the lamps being hung in pairs and sustained by cords passing over insulated pulleys, each lamp balancing the weight of its mate.

Electric Fountains.

The first electric fountain appears to be that of Sir Francis Bolton, who patented the arrangement broadly in 1884. It is recorded that Mr. Dwight Wiman purchased the American patents for his father, Mr. Erasmus Wiman, and with the assistance of Mr. Luther Stieringer, now consulting engineer to the World's Fair, put it into successful operation on Staten Island, at the cost of some $40,000. The forms used mostly are the wheat-sheaf, center jet and rocket. The jets of water varied by steam seem to be most effective when illuminated with the brilliant colored rays of the electric light. An allegorical group, representing Columbus' ship, designed by Mr. McMonnies, will be a prominent feature of the electric fountains at the exhibition, and virgins, sea horses and other groups will make an imposing sight. The fountains will be illuminated by thirty-eight arc lamps, the controlling levers being placed in chambers beneath the pools, but directed by electric signals from the tower of the machinery hall. The jets will all be hidden by artistic foliage, the water seeming to spring from an aquatic floral device.

Ideal Electric Lighting.

There is probably no church edifice in the United States to-day which is so completely and beautifully lighted by electricity as that of St. Francis Xavier, in West Sixteenth street, near Sixth avenue. The full power of the plant is rarely brought into play, except on festival occasions. A visit to the church at such a time is sure to be rewarded by a spectacle of brilliancy and good taste which is seldom seen anywhere. The architecture of the interior is peculiarly adapted to successful electric lighting. The style is Italian Renaissance, and the number of pillar capitals, alcoves and arches furnished Mr. Columbani, the designer of the effects, with an admirable background for the working out of his ideas.

There are about two thousand lamps on the main floor of the church, which are controlled by sixty-two switches. The switchboard is in a room by itself, back of the main altar. Every capital of every column in the church is surrounded by a row of sixteen-candle-power lamps, and has its own controlling switch. Transparent globes are used in these lamps, but in the main altar the globes are all opalescent and are ranged in rows but a few inches apart. The tabernacle is lighted with eight sixteen-candle-power opalescent globes of a cylindrical patern, made especially for the church equipment.

But the most beautiful effect is gained by the arrangement at each side of the altar steps. A pedestal of alabaster at least four feet high is surmounted by an exquisitely carved base of about the same height. Six glass lilies of delicate pink texture spring from the vases through carved foliage. The stamina of each lily is a tubular lamp like those in the tabernacle. When the current is turned on the effect obtained is positively ideal.

Not only do the lilies light up their opalescent stamina in warm contrast to their pink petals, but the vases and pedestals, which are hollow, glow into radiance, causing the veins of the alabaster to show out in all the beautiful tints of the natural stone.

Above the outer edge of the alcove in which another altar stands is a white cross, composed of sixeeen spherical opalescent globes. Following the line of the arch and depending from the cross is a vine with thirty tubular opalescent lamps of diminutive size and run in two series. At the back of the altar is another vine, with a plentiful supply of grapes hanging from the branches. Intermixed with the foliage at different points along the length of the stem are twenty-four red and white miniature lamps. This lot is run eight in series. From each side of the alcove a single jet projects. It is composed of a large red rose, deep in the center of which nestles a sixteen-candle.power lamp. At each side of the proscenium arch a swinging candalabra, composed of brass palm leaves, carries six sixteen-candle-power opalescent globes. Up behind the outer arch, and out of sight of the spectator, is a corrugated glass reflector, which reflects the light of thirty sixteen-candle-power lamps. This superb arrangement makes the altar the most completely lighted one in the United States, if not in the world. The entire plant necessary for the production of this effect cost $15,000.

Electrocution.

The latest execution by electricity seems to have been a complete success and to have been accomplished according to the ideal of the original advocates of the method. The man was brought from his cell, arranged in the death chair and killed within the brief period of four minutes and forty seconds. Those present state distinctly that there was no burning and no convulsions or seeming revivals of consciousness. Death must have been instantaneous, as the current struck him while he was pronouncing the word "me" in a prayer, and the lips remained in the position produced by sounding the letter e. It is possible that the electric current meets with varying resistance in different subjects. If it can be made to kill all murderers as neatly as in this latest case, the electric chair must be pronounced a success.

A Girl Discovered Electrocution.

Miss Ella Wilson of St. Louis claims to have originated the idea of execution by electricity. "She wrote a piece," says a friend, "which showed a man in the death chair undergoing electrocution. Well, it seems when Kemmler, the first victim of electricity, was put to death in New York, Miss Wilson discovered that they had used her idea entirely in the construction of the chair.

She secured an injunction against the State, and after a small legal battle the warden of the penitentiary was compelled to change its mechanism in order to comply with the law and still not infringe on Miss Wilson's idea. Bright girl for 19, isn't she?"

Possibilities of Electricity.

Prof. A. E. Dolbear, of Tuft's College, in a recent article in a Boston magazine, forecasts the possible accomplishment of electricity:

Prof. Dolbear begins by telling us what we may not expect to accomplish. One thing is that there remains very little, if any, improvement in the dynamo and motor, so far as their mechanical efficiency is concerned. The dynamo returns 92 to 95 per cent of the power put into it, and it is hardly to be expected that the very small margin of loss will be much reduced by improved dynamos. The conversion of one form of energy into another without some wastage is one of those things which the seekers after perpetual motion have always sought in vain. There may be great improvements, however, in the ways of generating electricity. The steam engine, which we must now depend upon for the production of power, is a most wasteful device, so far as the natural forces are involved. Only one-sixteenth of the heat energy bound up in the coal which we burn in the fire-box is reproduced in the driving wheel of the engine. Here is a clear loss of 93 per cent. One of the greatest fields now open to inventors and discoverers is to learn how to convert this heat energy directly into electrical energy without the intervention of the engine and dynamo. This is one of the problems that Edison is working on. Until something of this sort is discovered the principal opportunities for lessening the cost of generating electricity will be found in utilizing water power, wave motors, and other natural agencies, which will be cheaper than coal.

There is a possibility for great improvement in the incandescent lamps. Tesla has lately worked out some most interesting problems in this line and has been able to light an incandescent lamp held in his hand with an expenditure of energy not so much as one-tenth of that spent in an ordinary lamp. This means that with proper appliances ten times as much light can be got as we now get with a given expenditure of power.

Heating rooms, with an electric current, is also entirely feasible, and the only reason it is not now common is its cost. When methods of producing electrical currents are cheapened there will be no reason why houses should not be heated as well as lighted by the energy that comes from the wire.

Cooling, as well as heating, may be accomplished by electricity.

When the face of a thermopile is heated, it gives a current of electricity. If a current from some other source be sent through the pile in the opposite direction, the face of the pile is cooled, and ice may be formed in this way. The same current at the table will keep the tea hot and the water cold.

In transit, the most wonderful accomplishments yet remain. Prof. Dolbear says:

"A 500-horse power motor can now be made as readily as a 500-horse power locomotive, and that the former can run safely two miles a minute there is no manner of doubt. It is altogether probable that within a year from this time electric trains will be run at this speed between Chicago and St. Louis, and with as great safety as with present express trains. The completion of that road will probably precipitate a rapid change of all railroad work. It should be remembered that the sudden adoption of such a new method, which renders useless the present appliances, would be ruinous to most roads in the country; nevertheless, the time may not be so distant when all locomotives will have to go to the dump, save here and there one in a museum, standing like an extinct mastodon."

A New Safety Lamp.

An ingenious form of electric safety lamp is now made for use in dangerous mines, powder magazines, and all places where an accidental breakage of the glass bulb might lead to an explosion. In order to entirely eliminate the chance of any danger, the inventor has inclosed the lamp proper in an absolutely air-proof lantern, the peculiarity of his device being the means for switching the light on and off. The wires are attached to terminals on the base of the lantern, and underneath the lamp socket there is a small pair of bellows which make the necessary contact on being slightly inflated. On the cap of the lantern is an air valve to which a rubber pear-shaped syringe can be attached. On compressing this the bellows become distended and switch the light on. Should the lantern fall and be broken the escape of the compressed air releases the switch and instantly cuts off the current. Moreover, should the interior lamp happen to be broken the superfluous air fills up the vacuum and the same effect takes place.

MAY 1893

ELECTRIC LIGHTING MONOPOLY.

The Contention of the Sawyer-Mann Company in Defense of Its Right to Manufacture an Incandescent Lamp.

WASHINGTON, May 8.—At the session of the Supreme Court of the United States last week a petition was presented asking the Court to bring up for review and determination the case of the Edison Electric Light Company et al. vs. Sawyer-Mann Electric Company, now pending in the Circuit Court for the Southern District of New York. In support of the petition, an additional brief was filed to-day by R. H. Bristow, which presents the arguments for the granting of the petition. It also discloses some interesting facts in the controversy involved in the suit which is really between the General Electric Company, a combination of the Edison and Thomson-Houston corporations, on the one hand, and the Westinghouse Company, successor to the Consolidated and Sawyer-Mann companies, on the other.

In the court below the Edison Company sued for an injunction against the Sawyer-Mann Company to prohibit it from manufacturing a lamp said to be an infringement of a patent granted to Edison in January, 1880, which had been held to be valid in another proceeding. Counsel for the Sawyer-Mann Company contended that the injunction sought ought not to be issued for two reasons:

1. That the Edison Company has been guilty of laches. Although the patent was issued in January, 1880, no action was taken to prevent its infringement until May, 1885. During all that time competitors of the Edison Company were engaged in the business of furnishing electric light plants without objection, and stockholders of these and other companies were thereby induced to invest their money in similar enterprises. All this investment, estimated at $25,000,000, counsel say, is at stake, and they argue that the Court ought not to permit the Edison Company, after sleeping on its rights these five years, to reap the benefit of the pioneer work done by its competitors, the result of which has been to make the business remunerative.

2. That the Edison Company is a part of a combination the very existence of which is unlawful. Its purpose is to create and maintain a monopoly of the electric lighting business, and it can not, therefore, have the aid of the Court in carrying out the illegal purposes of its organization.

Practical Rule for Determining the Direction of Currents in Dynamos.

Mr. Heinrich Kratzart writing from Vienna, gives a very simple practical rule, which he claims as original with himself, for determining the direction of the currents in the armature of a dynamo which is equally well applicable to bipolar and multipolar machines, as also to rotary current machines. The rule is as follows: If the armature revolves to the left the direction of the current in the portions of the windings on the ends of the armature will be the same as the directions of the lines of force; or, in other words, the lines of force and the electric current will have the same direction in looking at the end of the armature; if the armature revolves to the right the current and the lines of magnetic force will have relatively opposite directions. This rule of thumb is certainly very simple and is well worth the attention of those who have to do with dynamos. As to its supposed novelty, however, Mr. Kratzart is mistaken, as he has been anticipated, though doubtless without his knowledge, by more than seven years, precisely the same thing having been published in Mr. Carl Hering's book on "Dynamo Electric Machines," page 44, in which the following rule is italicized: "If the rotation is opposite to that of the hands of a watch the current at that end will have the same direction as the lines of force." In a motor this rule must be reversed.

Drying Tea by Electricity.

Another use has been found for electricity. In Ceylon experiments have shown that it is more economical to dry leaves by its agency than by the old method, and extensive plants have been erected for that purpose.

A considerable freight business is being carried on by an electric railroad in Maryland, operating eighteen miles of track in a good farming country which is not reached by steam roads. The cars used have a capacity of five tons.

It has been determined that the temperature of an electric arc light remains constant at about 6300 Fah. This temperature can not be increased or diminished by changing the size or amperage of the arc.

Something About Asbestos.

Asbestos, which has come to be largely utilized by electrical engineers, is one of the most interesting substances employed in the arts. Many new beds of this material are being discovered, but except from the Canadian and Italian beds, the specimens secured are practically useless for manufacture. Large quantities of floss and powder asbestus are obtained from the district of the Susa valley, Piedmont, and in the second district, about thirty miles long, in the Aosta valley, the deposits are said to be practically inexhaustible. A third district, which is still more important, centers at Valtellina, the route to which passes Milan and Como to Colico. The Canadian deposits are in the Black Lake district, between Quebec and Sherbrooke. The asbestus-bearing rock is usually some kind of a green serpentine, and in working it is first crushed in special machines so as not to destroy the fiber. The long fiber is shaken, carded and spun, much like cotton and wool, into yarns, tapes and cloths. In the rubber department it is proofed and made into sheeting, tapes and rings for steam and other joints, or into cloth and millboard. A special kind of packing for high-pressure cylinders, known as metallic cloth, is made by weaving together brass wire and asbestus, and is used in many marine engines. Every part of the fiber is utilized, the shorter lengths being made into millboard, and the fluff and powder into non-conducting composition. The enactment by the English Board of Trade of the proviso that all steam-pipes and boilers shall be tested by hydraulic pressure to double the working pressure at stated intervals, the lagging being first removed, necessitates the use of a covering which can be removed without trouble. To meet this requirement non-conducting asbestus mattresses are now made weighing only one and one-half pounds to the square foot. Asbestus is used for innumerable other purposes, among which are the composition of fire-resisting paint for exposed woodwork, funnel paint and bunker baffle plates to keep off the heat from coal-bunkers.

Prof. E. J. Houston, in a paper recently read before the Franklin Institute, attempted to explain the curious fact discovered by Tesla, that electric currents of extremely high potential and alternating with great frequency—such as 20,000 times a second—have no injurious effect upon the human body, while currents of lower potential and alternating much less frequently would instantly destroy life. According to Prof. Houston's theory, the alternations take place so rapidly that the superficial portions only are traversed by the discharges. The more deeply seated, vital organs being thus free from contact, such discharges are necessarily harmless. As the frequency of alteration increases, the body becomes more and more protected, until, when the frequency becomes as great as that of the other waves which cause sunlight, they would probably produce on the surface of the body the same genial effects as are produced by the light and heat of the sun, with which they are probably identical.

Quite a number of beautiful and varied luminous effects may be obtained with very little trouble by the use of lamps of different manufacture that have been converted into Geissler tubes. A simple method of effecting this conversion is given by E. M. La Boiteaux: "A burned-out lamp, and, if possible, one in which a piece of the filament has been broken off, should be procured and the ends left separated about an inch. To each terminal of the lamp a piece of wire should be soldered and connected to the secondary terminals of an induction coil yielding a one-eighth inch spark. The globe should be held in one hand and the coil started, and the glass point where the lamp has been sealed must be rubbed off with a fine file and gentle pressure. The filing should be continued until the discharge diffuses the bulb, and then the point is quickly sealed in the flame. The object, of course, in filing the point is to allow a certain amount of air to enter the globe, producing a low vacuum, through which the discharge will readily pass."

Electric Lantern.

A new hand-lantern is being used by Russian officers for inspection of trenches and mines at night. It is in the form of a tube 2 feet 6 inches long the interior being made of tin. Tiny cells forming a battery, are superposed in this tube and connected together in a special manner. The power of the light is considerable, and the form is found extremely convenient. The lamp is enclosed in six plates of glass at the top of the tube, and the degree of light is regulated by screw at the lower end. It is stated as likely that the lamp will be adopted by the Russian Government.

Baking Brick By Electricity.

In view of the rapidly increasing development in all branches of electric heating, it is hardly surprising that the idea of an electric brick kiln should have assumed practical shape. In this as in all other applications of electricity, a great saving in time is effected, and whereas, by the ordinary method, the baking of bricks extends over three days, by the new process they are turned out in three hours and a half. Moreover, in the same way that in electrical welding the parts joined together are more tenacious in texture than the rest of the metal, so the bricks electrically baked are said to be harder and better than those made in the usual way. A singular point in connection with the improved process is, that the presence of mineral, which formerly created such havoc by cracking the bricks wholesale, is now a distinct advantage. In fact, the more mineral there is in the clay the better, because it forms a resistance and heats the interior of the brick. The apparatus is of the simplest description, consisting of a table covered with iron brick-molds. The table is 8 by 14 feet and holds 1000 molds, which are joined together like pigeon-holes. Each mold is the size of a brick which has been pressed but not baked, and has a loose cover, which follows the brick as it shrinks. The pressed bricks are placed in the molds, the covers adjusted and the current turned on. The iron sides of the molds form the resistance, and the bricks are virtually inclosed by walls of intensely heated metal. When the bricks have shrunk to the right size, the covers automatically turn off the current, and the bricks are dumped.

A New System of Electric Heating.

A vast deal of energy has been applied in the attempts to heat electric cars by means of the electricity which is the source of their own propelling power. The ordinary car stove has never been accepted as an ideal heater, however economical it may be, for very apparent reasons. It vitiates to air, is not clean, occupies a considerable space and requires a large amount of attention on the part of the conductor. Electric heating is unquestionably the method of the future, and much ingenuity has been brought to bear on its development. The main difficulty hitherto in the adoption of electrical heat in car work has been the relatively high cost. This objection is overcome in a new system, which not only produces the heat economically, but also distributes and preserves the heat units. The various heating devices on the market depend on the heating of high resistance wire by a current of electricity, which heat is at once dissipated into the surrounding atmosphere. The new system, on the contrary, while generating its heat by passing current through high resistance wire, does not allow it to be dissipated into the air, but conserves or stores it in a generator placed out of sight under the seats of the car, and then distributes it by a system of pipes containing a chemical liquid of high latent heat, which is heated in the generator, and which heats the car uniformly by radiation and diffusion. The question of cost will naturally vary in each locality, according to circumstances governing the cost of horse-power, but it is safe to assume that in all cases the new system will be cheaper than the old, as the real secret of its success lies in the storage properties, both of the generator and the liquid. A proof of this was given in a recent test, when a car to which the system had been applied started out at 2 o'clock, the inside temperature being 65 degrees and the outside 23 degrees, running a regular service, both front and back doors opening continuously, and at the end of three hours and thirty minutes, with no current on during the whole of that period, *i. e.*, with nothing but the stored heat, the inside temperature had fallen off only 7 degrees, while the outside temperature remained practically constant.

A New Submarine Boat.

The trial is reported of a new electrical submarine boat, which is said to be favorably regarded by the Italian Government. She is twenty-six feet long and eight feet wide, and has the peculiar depth of eleven feet, the total weight being forty tons. The special advantage claimed for this boat over all others of its kind, is, that it can remain under water, if need be, for the space of forty-eight hours, besides being able to descend to a depth of 130 feet.

Where Electricity Comes From.

The sparks, which, in cold weather, fly from the finger when a metallic object is touched, are due to the electricity produced by the friction between the soles of the shoes and the carpet. The electricity is not formed in the body at all and has nothing to do with the vital processes.

MAY 1893

Insulating Wire by Paper.

While electricians have been searching high and low for a perfect insulating medium, especially for high tension currents, an every-day material has been utilized for this purpose in a very practical and effective manner. For a long time the value of insulation composed of spirally-wound and overlapping strings of pure vegetable fiber paper has been recognized, and many patents have been taken out, having in view its more efficient application, but only recently has the paper insulating industry attained dimensions which entitle it to a prominent place in the electrical field. The paper, which is specially made, is thoroughly cured before being used. The rolls are mounted on machines and are cut into strips by circular shears, which leave the paper resembling "ticker tape." The spools of paper are then placed on mandrels in the covering machines, and as the wire feeds through, the paper is laid on in overlapping spirals at the rate of from 60 to 500 revolutions of the machine per minute. The wire is then passed through the dies, which materially increase the tightness and compactness of the insulation. The next step is the winding of the wire on iron reels, which are placed in drying ovens that have a temperature of 250° Fahrenheit. This expels all moisture, and the wire is suddenly plunged in a special secret compound, and for some time subjected to a stewing process at a temperatnre of about 275°. The wires in due course go from the tanks to the braiding or leading department, where they are finished. Although paper insulated wire is used largely in telephone work, it has been found very effective and reliable with high potential currents, even up to 10,000 volts. A point greatly in favor of paper insulated wires and cables is that they are practically fireproof.

Improvements in Storage Batteries.

The aim of all makers of storage batteries of late years has been so to construct a battery that it should be impossible for the active material to fall off the plates. This has from time to time been accomplished, but at a great sacrifice, as it inevitably resulted in another serious defect—the lessening of the efficiency in consequence of the increase in the internal resistance. Progress in this branch of electical work has been much delayed by the extent to which inventors allowed themselves to be hampered by the idea that to keep the active material from falling off the plates a free circulation of the solution was indispensable. This is now found to be no longer absolutely essential, providing a porous and also absorbent substance (capable of absorbing the sulphuric acid as fast as it is made in charging) has been placed between the plates. This permits of the placing of the plates so close together as to make one solid, compact mass of the element, so that there is no free solution to spill and spread devastation around when the battery is used for traction and other purposes, and a number of years is added to the life of the battery. By a recently discovered process a Plante battery has been developed, in which the active material is made electro-chemically in one hour and fifty minutes. The plates in this cell are made from one integral sheet of lead three-eighths of an inch thick, and prepared for treatment by a new method, which does away with all joints or soldering, thus avoiding any chance for local action. Beyond this, the saving in the cost of making the plate by the new process is considerable. It is a hopeful sign, among other indications of the steady progress of the storage battery, that an English electrical power-storage company, in its prospectus of two years ago, when introducing a new type of cell, made a reduction in the prices per ampere discharge of about 40 per cent. This company has now made a further reduction, and is now able to offer a battery for the same rate of output at less than half the price of three years ago. Another important item, more especially in connection with central stations, is that the battery now occupies only half the space that it formerly did.

A novelty in canes is one which contains a battery which supplies a current for a small incandescent lamp inserted in its head. Whenever it is desired to use the lamp a cap covering the head is removed, and the cane inclined in such a manner that the contained solution comes in contact with the plates of the battery. A current is then obtained which will maintain the light for a couple of hours.

By a peculiar prerogative not only each individual is making daily advances in the sciences, and may make many advances in morality, but all mankind together are making a continual progress in proportion as the universe grows older; so that the whole human race, during the course of so many ages, may be considered as one man, who never ceases to live and learn.—[Pascal.

Train Dispatching by Telephone.

Train dispatching by telephone is still in its infancy, but there are a number of tramway companies which operate their cars in this manner. It is stated that the most complete system of this kind is on the Denver Tramway company's roads in Colorado. Here the train dispatcher has an office upon the third floor of the company's main building, away from all sources of annoyance. He sits at a large table with a transmitter in front of him and a receiver clamped against his left ear. Twelve electric lamps, corresponding to as many stations on the system of lines, are placed in front of his seat, and every time one of them lights up it shows that a car has reached the corresponding station and is waiting to be dispatched. This is done by pressing down a key on the board corresponding to the light which connects the instrument at the station where the car stops with the train dispatcher. The latter then gives the conductor the time for him to leave, closes the key and is ready to attend to another station. The cars do not run according to any time table, but are dispatched as nearly as possible with headways corresponding to the travel. The dispatcher's position is by no means a "snap," for sometimes two or three lamps are burning at once, and during busy hours there are about four calls a minute to be answered. In order to facilitate handling the cars a second station is located at a street intersection where most of the traffic passes, and the operator here handles men and transfers cars in case of a blockade or unusually heavy travel.

Electric Time.

Many of the hotels and palces of business in this and other cities have electric clocks, marked as keeping "observatory time," which are corrected every day at noon, Washington time, by the Observatory at Washington. These clocks are rented by the Western Union Telegraph Company, and like everything it furnishes, they cost money. A $3 clock and $2 worth of wire rent for $1 a month. At the World's Fair a great ball is dropped at noon by the same current that tells the time all over the country. This ball is 5 feet in diameter and is made of canvas on a steel frame. It will be wound up each day to the height from which it is to fall, and it will be set and electrically connected in such a manner that the breaking of the circuit at 12 noon will release it.

The cable by which it will be controlled has already been laid, connecting the new observatory with the entire Western Union telegraph system, the touch of a button at the Washington end of it instantly transmitting notice of the hour over 350,000 miles of wire.

When that button speaks the whole country listens, and the hands of 70,000 electric clocks all over the country will point to the correct minute and second. There are 7000 of such clocks in New York City alone.

All railways, factories and industries of every kind pay attention to the signal. Three minutes before noon each day all Western Union lines are cleared of business, every operator takes his finger from the key, circuits are opened, and at the instant when the sun passes over the seventy-fifth meridian the spark of intelligence is flashed to all parts of the country. It requires less than one-fifth of a second to reach San Francisco.

The 12 o'clock signal sent from Washington indicates 11 A. M. for Chicago, 10 A. M. for Denver and 9 A. M. for the Pacific Coast, the United States being divided into four perpendicular strips, and each strip setting its clocks by the time of the meridian which bisects it from north to south. Thus each strip is only one hour later than the next strip to the east.

An Electric Horn.

An electric horn has been devised to take the place of electric bells or gongs, more especially on ships where an alternating current of electricity is available. The apparatus is based upon the principle of the telephone receiver, and consists in its simplest form of a disk of sheet-iron placed in front of one of the poles of an electro-magnet, the coils of which is arranged to take an alternating current of 100 volts. With a current of a given number of alternations, the pitch of the note is constant, no matter what the diameter or thickness of the disk may be, since the latter is obliged to vibrate at the same rate. The timbre and intensity of the sound, however, can be made to vary in a number of ways. In order to obtain an intense sound with a small amount of current, the diaphram or disk must strike, while vibrating, the iron cord or some other body. In this apparatus there is no break in the current, as occurs in the ordinary electric bell, and the sound is therefore continuous.

London Electric Railways.

The proposal to run a tubular electric railway from the great railway junction at Clapham, London, under the river to Kensington and Paddington, has been defeated, and the reasons for its failure may possibly be weighed with some profit in this country. The real stumbling block was the opposition brought to bear on the scheme by the Royal College of Science and the Central Institution in Exhibition road, which were in the line of the proposed railroad. From an electrical engineering point of view it is to be regretted that the line has fallen through, since two novelties were proposed, the employment of a pressure of 1000 volts and complete metallic circuits. On the other hand, the promoters appear to have made a great tactical error in refusing to deviate their line of route so as to satisfy the professors of the scientific institutions, who, alarmed about their laboratories and the delicate instruments contained therein, only insisted on the line passing no where closer than 400 yards to this scientific center of London. One English engineering journal protests strongly against the grounds of this opposition, which it regards as so slight as to merit little consideration. The special committee which had the question in charge were led to believe that the main occupation of electrical students consisted in working with sensitive magnetometers. As a matter of fact, most electrical engineers never use magnetometers. The disturbance of mirror galvanometers is also a matter of no real importance, as the moving coil can be employed and is often preferred to the Thompson arrangement. The true cause of the opposition is shown to be the fear entertained by the teachers at the college that the vibrations or electric or magnetic disturbances might interfere with research work on which their living depended. The railway would be of great public utility, and it is held as absurd that it should not be constructed because it would interfere with a smali fraction of research work. "If the whole of the research work done in Kensington were estimated in its effects on the economical position of the country, it would probably be valued at a very few pounds sterling."

WHAT IS ELECTRICITY?

Attempt of a Scientist to Explain its Peculiar Force.

As far as the writer is able to understand the matter now, says *The Electrical Review*, electricity is simply motion of the molecules of the different substances which are the subjects of electrical action, just as heat, light and sound are, and the only difference between these forces is the rate of the motion.

The motion of sound, as we all know, is comparatively slow; that of heat and light very rapid. That of electricity would appear to be somewhat between the slow motion of sound and the rapid motion of those waves whose motion is slowest.

And it would appear that the wonderful adaptability which electricity shows for every kind of work is due entirely to the position which its rate of motion occupies in the scale of the energies.

It would also appear that the reason this wonderful agent laid dormant for so many ages, and is even now only partially developed, is very largely at any rate, because we have no sense which responds to the particular periods of vibration comprised within the electrical range.

Heat currents would be far more efficient than electric currents if we could make use of them as we do of the latter; and, as before remarked, the reason electricity is such a useful agent appears to be because its rate of vibration is sufficiently high to admit of rapid transmission, yet not sufficiently so to be destructive. It only becomes destructive when it is transformed into heat.

The old Hindoo saw, in his dream, the human race led out to its various fortunes. First, men were in chains, that went back to an iron hand—then he saw them led by threads from the brain, which went upward to an unseen hand. The first was despotism, iron, and ruling by force, The last was civilization, ruling by ideas.—[Wendell Phillips.

All excess is ill; but drunkenness is of the worst sort. It spoils health, dismounts the mind and unmans men. It reveals secrets, is quarrelsome, lascivious, impudent, dangerous and mad. He that is drunk is not a man, because he is void of reason that distinguishes a man from a beast.—[Penn.

Every industrious man, in every lawful calling, is a useful man. And one principal reason why men are so often useless is that they neglect their own profession or calling, and divide and shift their attention among a multiplicity of objects and pursuits.—[Emmons.

MAY 1893

OFFICIAL JOURNAL OF THE
National Brotherhood Electrical Workers.
PUBLISHED MONTHLY.

J. T. KELLY, SEC'Y-TREAS.,
PUBLISHER AND EDITOR.
G. J. O'REILLY,
Business Manager and Associate Editor.
904 Olive St., St. Louis, Mo.

ENTERED AT THE POST OFFICE, AT ST. LOUIS, MO., AS SECOND-CLASS MATTER IN MARCH, 1893.

SUBSCRIPTION, $1.00 PER YEAR IN ADVANCE.

AS THE ELECTRICAL WORKER reaches the men who do the work, and recommend or order the material, its value as an advertising medium can be readily appreciated.

St. Louis, Mo., May, 1893.

Advertising Rates on Application.

WE have a number of able men in our ranks who, if they wished, could furnish some valuable information and suggestions. These members are distributed throughout the various local unions, and seem to forget that the columns of THE ELECTRICAL WORKER are always open to discussion of any and all electrical questions, or any odd experiences, or of items or news that would be entertaining reading to our members. We think a column of "Queries and Answers" would be interesting and instructive, and wish the brethren would commence throwing them at us. Also please remember that though each local has a Press Secretary this does not debar any other member from communicating with us; on the contrary, we would be pleased to hear from all.

TRADE difficulties have been entirely too numerous of late. Organization and education should precede any demand for an increase in wages. If the members of our craft are thoroughly organized and competent they will have very little trouble about the wage question. Rome was not built in a day, neither can we expect to accomplish everything in a year. We are banded together for mutual aid and improvement. We should aim to thoroughly master our craft, be sober and industrious, and show that we deserve better wages. There are too many incompetent and careless men in our ranks. Some men have worked for years in the business in a don't-care kind of manner, and are no better to-day than they were when they worked a month at it; others have taken hold as if born to it, and seem to "catch on" as if by instinct.

ON the 13th of next November the third annual convention of the N. B. E. will meet. A great many important questions will come before that convention, and local unions should consider well the requirements of our organization. We all remember how it was at our last convention; very few of the delegates knew what they assembled for, and many went away dissatisfied. We should profit by our past experience, and prepare in time for the next convention. One of the most important questions to be considered is that of apprentices. This question must be met, and we should prepare for it. The eight-hour question, the subject of strikes and lock-outs, the manner in which our Executive Board should be constituted, the matter of a general office—whether it should be permanently located or moving around the country—the best manner to organize the unorganized cities of the country, and a number of other important questions will come up. Our local unions should consider these subjects carefully, so that when a delegate is finally elected he can be given positive instructions, and thus voice the sentiment of the union he represents.

ST. LOUIS, MO., May 17, 1893.

Editor Electrical Worker:

Being a member of one of the most progressive locals of the Brotherhood, and also one who takes a deep interest in the same through the knowledge of the good it has accomplished. I also take an interest in everything that goes on in any of the locals throughout the United States. I will say right here that one of the most grievous and disastrous mistakes is made by local unions in going on strikes, unauthorized by the Brotherhood, and then expecting help and aid, morally and financially from the same. Its disastrous results may be shown in an instance of that kind. If any strike started in this off-handed way should be successful, it will make its bad effects felt by the encouragement it gives to other locals to do likewise. A strike may be instituted and won in certain places and under certain conditions on almost any pretense, that would result in the complete annihilation of organized labor in another place. This is one bad effect. Now, on the other hand, if a strike started unauthorized in a city should prove unsuccessful, then the result would certainly be blamed on the Brotherhood in general and would be almost sure to result in the loss of that local to the Brotherhood. Now, those questions are thoroughly explained in our constitution, and any local union acting in violation of this should be expelled. I may be wrong in saying it, but it is my belief that strikes are unnecessary, and if the locals of the Brotherhood would only put half of the energy that is expended in preparation for strikes in the part of the constitution pertaining to the educational feature, there would be no necessity for strikes. There are certain conditions that can not be overcome by organized labor, no matter how well organized, such as hours of labor, wages, etc., in certain parts of the country. This, brothers, has nothing to do with the instances where corporations take the aggressive and the members of organized labor are locked out. Those men, I feel sure, have the sympathy of every one in the country not interested in those monopolies, and will be supported by every one. Yours fraternally,

A MEMBER OF NO. 1.

The Atlantic Hotel, corner Van Buren and Sherman streets, Chicago, is quite a headquarters for visiting members of the N. B. E. W. The handsome manner in which the Cummings Brothers, proprietors of the cosy hostelry, entertained the delegates to our convention last fall made them many friends, and their liberal treatment of guests is in strong contrast to the exorbitant demands made by most hotels and boarding houses of the Windy City. If visiting the World's Fair, be sure and call, and you will meet many of the brethren.

G. E. STRATTON,

Personal.

Brother Stratton is a member of No. 9, and though only 24 years of age has spent half his life as an electrical worker and student. For so young a man he has held some important positions. At the White House, Washington, D. C., he changed the chandeliers to electroliers. He has had charge of the *Herald* plant, Chicago, and is now the County Electrician of Cook County, Illinois. "Excelsior" seems to be Brother Stratton's motto, and we wish him continued success.

Samuel Gompers, President of the American Federation of Labor, was a caller at our office last week. Mr. Gompers was in the city to assist the broom-makers organize a National Union, also to organize the tobacco workers.

Brothers Percy Edmunds and G. D. Richards of No. 16 took a change of venue and are now assisting Capt. McCullough equip his lines with electricity. No. 1 has taken charge of them, so they are in good hands.

A. J. Felz, General Organizer of the United Garment Workers of America, was in the city last week. Mr. Felz is a bright, active young man, and we wish him every success in his endeavor to organize his trade and abolish the sweating system.

Brothers J. W. Buis of No. 1 and Arch Holman of No. 9, met with a serious accident recently, caused by the breaking of a bell telephone pole at Kinder, Ill.

CHICAGO.

"Old Winter is still lingering in the lap of Spring," and from present appearances it looks as if the old fellow will stay there until thawed out by the Summer solstice. Since April 1st there has only been five or six sunshiny days—rain, hail, snow, wind and generally disagreeable weather has been in the great majority. This has not only retarded the attendance at the Fair, but has delayed the arrival and installation of exhibits. However, the work goes merrily and swiftly on, and by the 1st of June, weather, of course, permitting, the wonderful White City will show in all its glory. But even at present it is well worth visiting and any one complaining of not seeing 50 cents worth for his half dollar admission fee would scarcely be satisisfied with the earth unless the moon was thrown in and both fenced around at that. If any one thinks that the Columbian Exposition is only a county agricultural fair and can be "done" in a day or even a week a first visit will

MAY 1893

quickly disabuse the mind of that impression. A daily attendance of ten hours a day for a month and a close inspection of all its wonders would still leave many things unseen.

Just an instance will show how easily a person can miss one of the most interesting and most instructive places on the grounds. Through the kindness of Brother Ed Williams, of No. 41, we visited the electrical subways. A description of which will be found in our account of the World's Fair. At some future time we shall again refer to these subways and will try and have descriptive cuts to explain them more satisfactorily. We thank Brother Williams for a couple of entertaining and instructive hours and hope other visitors to the subways may be able to secure as pleasant and as intelligent a guide.

We visited Unions 41 and 9 this trip. The former installed five new members and the latter a round dozen. No. 9 has seldom less than 200 or 300 members at a meeting and think nothing of a midnight session. In fact, half past one or two o'clock Sunday morning is not an unusual hour for them to adjourn. They have some wonderful "rag-chewers" and "hair-splitters" in No. 9, and whoever occupies the chair has to be well posted in parliamentary rules or the "obstructionists" will soon tangle him up. Only five or six of the contractors have failed to sign, but they will probably do so ere our next issue. Work is slacking off a little and we are glad to see that most of the boys strike out for "fresh fields and pastures new" as soon as they quit their jobs, instead of hanging around, and, like Micawber waiting for something to turn up. This is wisdom on their part as the rush of work can not last much longer.

With a fraternal good-bye we would remind 9 and 41 that they are supposed to have press secretaries and the ELECTRICAL WORKER would be pleased to hear from these gentlemen next issue.

THE BUZZER.

May 3, 1893.

Editor Electrical Worker:

Last evening was the regular meeting of No. 41 and we had quite an exciting time. Ugly rumors were afloat about one of the prominent officers of No. 9, and we understand that an investigation will be demanded next Saturday night when No. 9 holds its regular meeting.

The Fixture Hangers Union has entered a protest in the Trades Council that the electrical workers are infringing on their trade.

The Chairman of the Council ordered that the electrical worker's work must stop at the opening and the "hangers" finish from that point. This is a bad blow for the "worker." The "hangers" are, in fact, trying to put us out of the Council. It is really disgusting to see such a state of affairs going on in an organization supposed to be composed of honest, intelligent men. Our strike is about at a standstill. A large number of contractors have signed the agreement, and we expect the others to do so in a short time.

Work at the World's Fair, except wiring for exhibits, has been about completed, and Jackson Park at night outrivals anything ever before attempted in artificial illumination.

P. L. ROSS, Press Sec.

When you visit Chicago do not forget to call on the old-time friend of electrical workers, John E. Fitzpatrick, 204 Washington street, Chicago.

GENERAL NEWS.

Where Electrical Workers May Look for Work.

OSHKOSH, WIS.—The Oshkosh Telephone and Electric Service Co., has been incorporated with a capital stock of $50,000.

RICHMOND, MO.—The Richmond Electric Light Co., has been incorporated with a capital stock of $40,000.

WILLIAMSPORT, PA.—The City Clerk has been authorized to advertise for bids for the erection of an electric lighting plant.

CHICAGO, ILL.—The Grand Central R'y Co., has been incorporated with a capital of $15,000,000. The company proposes to erect an elevated road in the city, and at the limits to drop to the surface. William J. Richardson, Robert Meadowcroft, John V. Farwell.

ST. PAUL, MINN.—Gov. Nelson has signed the bills appropriating $3,000 for an electric light plant at the Asylum of the Blind, and $7,000 for an electric plant in the school for the Feeble Minded.

INDIANAPOLIS, IND.—R. T. McDonald of Ft. Wayne, a heavy stockholder in the Thomson-Houston Electric Works, has purchased a controling interest in the Citizens St. Ry. Co. Every line in the city will be supplied with electric power.

READING, PA.—The East Reading Electric Co. has been incorporated with a capital stock of $100,000. Albert J. Brumbach, Prest.

DETROIT, MICH.—The Detroit Citizens Ry. Co. will extend its lines to the village of Grass Point. The extension will be three miles in length. The franchise was granted two years ago.

GRAND ISLAND, NEB.—The Grand Rapid Transit, Light and Power Co. has been incorporated with a capital stock of $250,000. A. S. Vest, E. G. Stolley. The business of the company is to operate electric motor cars. The work of surveying a new line will be commenced at once, and the line is promised to be in running order early this fall.

COLUMBIA, PA.—At a meeting held in the office of the Columbian Traction Co., the Columbia and Donsgal Ry. Co. and The Columbian Traction Co. decided to build the road themselves instead of giving it to contractors. E. N. Smith is Engineer, and Blake A. Mapledrom is Mechanical Supt., Frank Given is Supt. Work will begin at once.

WHITE PLAINS, N. Y.—Samuel Conover of White Plains has purchased the franchise of the Terrytown, White Plains and Chester Electric Ry. Co., and work will be commenced this summer. The road will now be called the Elensford, White Plains and Mamoroneck Ry. S. W. Parker of Mamoroneck and J. H. Morgan of White Plains are interested.

CINCINNATI, O.—The proposed new Sixth St. Market House of which the estimated cost was originally $40,000, will be fitted up with all modern conveniences. It is thought that the structure before completion will cost something like $55,000. It will be lighted by electricity. City Electrician Cabot, has under consideration specifications for lighting the market house by electricity.

EFFINGHAM, ILL.—The city has decided to buy and own its electric light plant; $16,000 in bonds will be issued for that purpose.

PEORIA, ILL.—The Jenney Electric Light and Power Co. has increased its capital stock from $150,000 to $200,000 and changed its name to The Peoria General Electric Co.

WASHINGTON, D. C.—Sealed proposals will be received until May 23d, for an incandescent electric light plant for the Tenth St. branch of the Record and Pension Office. M. R. Thory, Chief of Supply Division.

ROCHESTER, N. Y.—The train house and power house of the Grand View Beach Electric Road which runs along the lake shore for several miles, were burned to the ground. The loss is $60,000, covered by insurance. The summer's business will be a total loss, for the reason that the road is purely a summer road.

DESHLER, O.—The Council is considering the question of electric street lighting.

DALLES, ORE.—The Dalles Electric Light Plant will be enlarged in the near future.

DENVER, COL.—The Columbia Electric Works incorporated with a capital stock of $50,000; Harry W. Lawrence, Joseph R. Knowland, Henry H. Metcalf, Charles Pierson and Thomas H. Lawrence, 47 Barclay Building. The company will purchase, sell and hire electrical patents and general repairing in the electrical business.

WAUPUN, WIS.—The Council has granted a franchise to the Waupun Electric Light Co. It is expected that a plant will be put in this season.

PARIS, TEX.—The Paris Electric Light and St. Ry. Co. has given a mortgage for $160,000 to improve and extend the road. Jas. J. Walsh, President.

LOUISVILLE, KY.—A meeting of the Directors of the Louisville Steam and Electric Motor Power Co. was held. The affairs of the company were found to be in such condition that it was decided to rebuild. A committee was appointed to obtain estimates and plans for rebuilding. As soon as prepared these will be submitted to the stockholders.

CHICAGO, ILL.—Sealed proposals are invited by the Board of Cook Co. Commissioners for furnishing for the Cook Co. Hospital, 1500 incandescent electric lamps with U. S. base, 110 volt, 16 candle power, and 500 incandescent electric lamps with T. H. base, 110 volt, 16-candle power, bidders to state how long they will guarantee life of each lamp. M. S. Hyland, Supt.

COLUMBUS, GA.—The North Highland St. Ry. Co. has petitioned for right-of-way over seven miles of streets. A power house will be erected to furnish power for the street railway and light for the city. A. S. Carter, President.

DENVER, COL.—The Columbian Electrical Works have been incorporated with a capital stock of $50,000 to operate in Arapahoe County.

Trade Notes.

Day's Kerite has a very handsome exhibition in Electricty Building, World's Fair. One could scarcely believe that such a prosaic article as wire could be turned, twisted or fashioned into such odd and beautiful shapes. The exhibition is very unique, and as it is in one of the best locations in the hall it attracts everyone's attention.

The Ansonia Electric Company don't believe in sparking, and as soon as the Wirt Brush, which is one of their fast selling specialties, is generally introduced, sparking at least on the connection will be a thing of the past. The brush is made of layers of different metal, built on scientific principles, it is claimed, and will not spark or cut the commutation.

The Columbia Incandescent Lamp Company are busy filling orders from old customers and the many new ones that are being added to their list since resuming business. Last week they shipped lamps to Central America and Australia. They are the only company that guarantees customers against infringement claims. They are sending out a handsomely framed portrait of Henry Goebel, the inventor of the incandescent lamp. Congratulations are pouring in to them from all sides on their victory over the trust.

McLean & Schmitt, formerly with the Excelsior Electric Company, make a specialty of re-winding armatures of any system, also repairing all kinds of electrical apparatus.

The Ansonia, formerly the Electric Supply Company, are fitting up handsome club rooms at their headquarters in Chicago, and invite everyone to call and make themselves at home and have their mail or telegrams addressed to their care.

The Commercial Electrical Supply Company report business as very flourishing. They are carrying a very heavy supply of electrical wares and do not have to ask customers to wait till they telegraph to some outside house or factory to fill an order. They are making it very lively for competing supply houses.

The American Electrical Manufacturing Company report that from the first day of their resuming operations in the manufacture of the well-known American Incandescent Lamp, orders have been coming in at a very lively rate. Their capicity is more than doubled, and they are beginning to run a night force. They are in receipt of many letters from their trade expressing great satisfaction in being able to again use the American lamp, and numerous inquiries and orders from new customers. They are using every endeavor to fill orders promptly, but say that up to this time their orders have consumed their whole output.

MAY 1893

X Page

CORRESPONDENCE.

[The Press Secretary, though an officer of the Local Union, is really a resident correspondent of the ELECTRIC WORKER, and should keep his paper thoroughly posted on all matters pertaining to the electrical industry in the vicinity he represents. New plants, extensions of old ones, new electric roads, state of trade, new ideas, electrical novelties and accidents are a few of the topics to report on. Please notice that the minutes of the meetings are not required, except the report of new officers, and such matter as may be of general interest to all members.]

ST. LOUIS, MO.

Editor Electrical Worker:

ST. LOUIS, May 9, '93.

As President Lafferty was absent from the meeting, Vice President White called the meeting to order. Minutes of the previous meeting read and approved. A number of applications for membership were read and duly elected. There were ten new members initiated at our last meeting. Who can beat this? I want to say non-union linemen and wiremen in St. Louis are very scarce at this writing.

THE PICNIC.

The rain had a very dampening effect on our parade and picnic on April 30. But there were a great many of the boys in line, something like 100, which was a good turnout considering the weather. It takes a great deal of rain to dampen the efforts of the electrical workers when they undertake anything. There was quite a number of visiting brothers here from different locals and had it been a nice day we would have had at least 200 linemen and wiremen in line. We were late getting to the park, as we did not leave the hall until 2 o'clock. The running contest was won by George Hutchens of Local No. 1. George is quite a sport. The only thing that was lacking to make the races complete was the fat men's race. President Lafferty was right in it. But they wanted to run 140-pound men in, but the portly Dan couldn't see it. On July 4th we give a grand picnic at Ramona Park, which we hope to make a success—all kinds of athletic sports, among which there will be a climbing contest. Suitable prizes will be given the lucky ones entering the contests. We extend a general invitation to all locals of our craft and hope to see many of the boys from all over the country with us on that day.

Bro. John Siamons, while repairing a telephone wire on Second and Vine streets, came in contact with a live electric light wire, receiving a severe shock. John is none the worse for wear, but minus a pair of brand new pants. Well, as this is meeting night again, I will quit you for this time, but will do better next time.

Fraternally,

W. B. BOWLIN,
Press Sec'y.

N. B.—I forgot to state we elected a new delegate to Building and Trades Council in the person of Bro. Frank Kinsley, who is an inside wireman and a kicker from a way back, and if there is a kick coming I assure you he will kick and kick hard.

ST. LOUIS.

May, 1893.

Brother Electrical Workers:

I am still in the swim. If you have not heard from me for some time don't think that my ardor has grown cold; I am a union man and will do all in my power to build up the organization. I place it as a business and social enterprise combined. As to business it improves the number in their craft. A discussion on any practical electrical subject brings out new ideas. Some may refrain from asking a question simply because they think it absurd; I say ask it and hear the different opinions before discarding it. The simple question may drive some gifted brother into a new channel of thought and develop very flattering results.

Many are the questions asked by persons not in the business, and nearly all that have been put to me have caused me to learn more or less. In trying to answer, frequently a new feature bobs up and when followed to a finale is of great service. The many changes in our line has a tendency to keep us continually studying; some brother may have had a great trouble to master the peculiarities of some new appliance, and by putting questions regarding same he will endeavor to give his views of the matter, which certainly will be eddifying to the interrogator.

One great point to become a thoroughly good workman at any branch is not to think there is no one that can give you pointers. I care not who he be nor how long at the business, some one has made a point that never occurred to the old hand. When you learn enough to become a practical workman, remember you have but commenced. Every day brings out new features. Go at your work as if you were trying to make a living out of it and not stop just because you are not running in debt and can dress pretty well and eat three times a day. Give it your undivided attention, and when you have attained a standard of proficiency, employers will bid for you, knowing that they can make more money by having a good and reliable man than an indifferent one. All knowledge is not derived from your own experience, for were it so we would know but little. Hear the trials of others and profit by what you hear, and the reward will follow.

Socially the union of craftsmen has had a tendency to exalt the desires of members. In our craft the improvement is very perceptible. You need not refer to what we term "old timers", but look for yourself. The men in electrical work of to-day are far superior to what they were but a few years ago. Not many moons have gone since in a conversation with some very nice persons of both sexes a certain gentleman's name was mentioned, and one person was lauding him for his gentlemanly behavior, and really became very enthusiastic until one of the party asked his occupation, and when told he was a lineman the enthusiast looked in blank astonishment and remarked: "I don't care if he is a dog-catcher he is a gentleman." Brothers, the same can be said of all if we but so wish it. Overcome petty jealousy. Do not think because one workman has a little better clothes or education than you that he thinks himself above you. Prepare to meet him half way and see what good people you have been passing unnoticed. A battered hat may cover a bright intellect or a ragged coat may cover a true, good heart. Attend the meetings of your union, say what you have to say, or if you are too bashful tell your ideas to some brother who has the gift of gab, and get the thing started, then you will come to it like a duck to water.

Demean yourself in a gentlemanly manner at all times and you will be rewarded with the respect of those that a few years ago would have turned their back on you as you passed them by. In looking back it makes my heart throb with an exulting feeling to see how much improvement has been made in our ranks. May the good work continue among the brethern, for it is a foregone conclusion that our journal, THE ELECTRICAL WORKER, will let no oppertunity slip by to do all the good it can.

Hoping to see meetings well attended and every brother come to the front with his suggestions, I am at your command, very humbly yours,

"BALDY."

MILWAUKEE.

May 7, 1893.

Editor Electrical Worker:

DEAR SIR—Having been so very busy the past two months; working almost night and day at the new underground system of the Telephone Company, I neglected to represent No. 2 in the last edition of the journal. I may say that No. 2 is still increasing in membership, slowly but surely, and hope to be able to rake in every electric worker in the city before it stops. The Telephone Company is just completing its underground system of metalic circuit. They have laid 50,267 feet of trench, 63,440 feet of conduits containing 154,788 feet of cable, which incloses 23,447,880 feet of wire under the streets of this city, at a cost of $232,000. By this outlay the company hopes to give perfect satisfaction to its subscribers on the metalic circuit. With the exception of the Western Union Telegraph and the District Telegraph Companies putting in call boxes and time clocks all over the city, there is nothing particular going on just at present. Mr. Editor, I would like to ask THE ELECTRICAL WORKER how it is possible to be able to distinctly hear conversations passing between parties on the outside surface of two big lead covered cables, running parallel in the ground with both, grounded at each end. I have asked and been told it is the fault of a poor ground at each end, when I happen to know that one end is grounded to a frame that has good ground from the river. Please solve the mystery and oblige a new beginner. Yours fraternally,

F. W. SMITH,
Recording Secretary.

NEW YORK.

May 8, 1893.

Editor Electrical Worker:

No. 3 will have quite a change in offices. Recording Secretary Lester C. Hamlin, Vice-President William Loudon, Inspector Charles Nelson, Trustee William Bloomfield and Delegates William Ivory and Thomas McCann, presented their resignations and a special meeting was voted for next Thursday, the regular meeting night, to fill the vacancies.

The linemen in Brooklyn are on a strike, also the linemen in the employ of the New York and New Jersey Telephone Co. The men asked for an increase of wages from $2.50 to $3 per day, and appointed a committee to call on the company. The members of the committee were immediately discharged and this precipitated the trouble.

May 1893

This is the busy season among the electrical workers of this city, and competent union men are in great demand.

This was especially the case during the Columbus celebration last week, and during the grand ball at Madison Square Garden on Thursday night, there were 50 extra skilled electrical workers in charge of the lights and electrical display under the supervision of Supt. McCutcheon of the General Electric Lamp Company.

Only union men were employed, as Delegate C. W. Hoadley of Local Union No. 3 inspected the cards of all the men as they were hired. The union held a meeting the same night and passed a resolution of thanks to Mr. McCutcheon for his recognition of the union and his considerate treatment of his men. A committee from the union presented Mr. McCutcheon with a copy of the resolutions at midnight while the ball was in progress.

Our delegates were re-admitted to the Building Trades Section of the Central Labor Union after a long fight by a close vote.

A council meeting, composed of delegates from Local Unions 32. 33, 31, 34, 3 and 36, was held yesterday in Jersey City, Grand President Miller presiding. A resolution was passed instructing delegates to bring before the next meeting of their unions a recommendation to place in this field a number of delegates to organize and attend to the interests of the locals.

The largest and most interesting work in our line recently done in this city is the Postal Telegraph Building now in course of construction on Broadway, opposite the City Hall. The Lemaire Electrical Manufacturing Company is doing the electrical work. Jos, A. Jacobs, formerly Superintendent for H. Ward Leonard & Co., is superintendent of construction. Mr. Jacobs was one of the active members of the famous Executive Board of No. 5468, and gave position, time and most excellent advice to our cause during the late trouble. He has the pick of the skilled Brotherhood men, and if he gets one-half of those who say they have pledged themselves to him, some of the other contractors will find it difficult to be so indifferent to many they now snub.

In my last letter I mentioned the condition of those I met on First avenue on a certain Sunday. A great many brother members of No. 36 feel that I refer to them, as they were employed by that company at that time. I wish to say that I only wrote about those whom I met, and did not or could not include them personally under that head, for I know that some of them can give me points and win; but I can vouch for the case as I found it. I knew of two brothers of No. 3 working there that day, but failed to see them, as I did not find the right lager joint—and one of them was my chum—and expelled, who, for an extra 50c a day has been a staunch enemy of our orgrnization, and as a reward received a setback in his position, as he no longer selects the men and drops them, as the company placed a Superintendent to superintend him. Well, his scabs gave him a yellow watch, and I am sorry to say it is reported that some members of No. 3 put up as high as $5 towards it, and I am more sorry to say that I have very few of those 20 or more on the list who could afford to subscribe one cent towards defraying burial expenses of the mother of a brother who was down sick with the pneumonia.

I think I can promise you a cut of an unusually fine switch-board in the near future. Bro. James Morrison, ex-Treasurer, is the electrician in charge.

All trouble on the new American Theater, Forty-first street and Eighth avenue, on account of the employment of two electric wiremen from Boston, has been settled by these men joining Local Union No. 3 of the N. B. E. W. of A., and paying $25 as initiation fee. These men are engaged in putting in a Kelly-Cushing switch-board to control the electrical lighting of the theater.

Our union presented Bro. John Trainor, who has been laid up for a month with a dangerous attack of pneumonia, with a purse of $100 last week.

The striking linemen of Brooklyn, who have been fighting for two weeks for $3 a day and nine hours, won a signal victory recently, when the Citizens' Electric Light Company signed an agreement with Local Unions Nos. 31, 34 and 36, agreeing to all the men's demands.

LESTER C. HAMLIN.

NEW ORLEANS.

May 10, 1893.

Hall of Workingmen's Amalgamated Council of New Orleans.

To all Labor Unions and Associations of Workingmen of the United States:

The manufacturers, merchants and capitalists, with the subsidized press of this city, are combined in a determined effort to crush all labor unions and associations of workingmen existing here.

A Federal judge has been found who, under the pretense that strikes have the effect of interrupting commerce, holds that those who exercise their rights to refrain from labor violate the recent act of Congress against combinations in restraint of interstate and international commerce, and who has made an order enjoining the labor unions and associations of this city from engaging in any strike.

The injunction so granted is merely a preliminary injunction, which may be set aside on the final hearing or on appeal to a higher court. The workingmen of this city intend to carry this case to the court of last resort, and they hope that the Supreme Court of the United States will rise above the considerations which have frequently affected the decisions rendered by many judges of the inferior courts. We believe the judges of the Supreme Court will give us justice; but even though their decision should be against us, it will be well to know that, under existing laws as interpreted by the courts, free men can be made slaves. If this be true, the sooner the truth becomes generally known the better, for when it becomes known, all men who love liberty will unite in securing the repeal of such iniquitous laws.

The expenses attendant on the litigation in which the workingmen of this city are thus involved will amount to a very considerable sum, and in view of the fact their cause is the cause of all workingmen, they feel justified in asking not only for sympathy but for material aid from workingmen of all other localities.

Contributions, which will be thankfully received, may be forwarded to WM. MOAKE,

534 Carondelet street, or

JAMES LEONARD,

President Amalgamated Council, 486 Royal street, New Orleans, La.

NASHVILLE.

May 9, 1893.

Editor Electrical Worker.

Union No. 5 is adding new lights to the grand circuit every meeting. Every member is doing his level best to induce non-union men to join our grand organization. We don't want "lushers" nor "false alarms," but we are trying to get men who can distinguish a battery from a dynamo.

The Cumberland Lighting and Power Company is overlauling all its lines and also raising 35-foot poles all over the city.

The Glendale Park Dummy Railroad is being re-constructed and electricity will be the motive power instead of steam as used heretofore.

The new Davidson County Asylum and Poor House is being wired for both arc and incandescents. It is concealed work and reflects much credit on Messrs. Lowery, Williams & Adams, who are wiring the building. This, when finished, will be the finest asylum in the South, and it is facetiously called "The Palace for the Poor."

Messrs. Williams and Adams have traveling cards from No. 9, Chicago, and are union men first, last and always.

Bids are advertised for to wire the Custom House for incandescent lights.

Honest Frank Harris of the Electric Light Company has been promoted from dynamo tender to second engineer. Success to you, Frank, you deserve it.

Ed Farwell is the handsomest man in the Union and he can climb like going upstairs.

At our last meeting a motion was made and carried to enforce the article relating to members and officers being absent without good excuses.

Brother Cantrell will be minus 50 cents next meeting. He is a gifted liar and has pulled the wool over our eyes long enough.

Smith is trying to bluff a backward spring by wearing a straw hat.

Wilcox is getting very mysterious and I think he is contemplating matrimony. He has my sympathy.

Gus Prang has been very busy the past week dodging the poll tax collector.

McEwen is a "plumb good 'un" and what he don't know about inside work is not worth knowing.

Wishing the workers success, I am fraternally,

P. H. LANGDON, Press Sec.

Electrical Education.

BY LEE BRIGGS OF NO. 5.

Having read not long ago a most interesting article about Nikola Tesla and some of his discoveries and inventions, I was greatly impressed by the clear manner in which it was written, and by the absence of the more technical electrical terms. As you are aware, most electrical papers use so many technical terms, that it takes a person well educated in electrical matters to understand what they are reading. Now, as the majority of us have not had the education necessary to understand any, except the most simple electrical terms, we lose a great deal of valuable information that would be of incalculable benefit to us. As something must be done to educate the members of our craft, what is the matter with making THE ELECTRICAL WORKER our teacher? By this I mean to have discussions on electrical matters and explain the various terms and phrases in such a manner that all of us could understand them. I think by this means we could teach each other, as well as be taught ourselves, for none of us know so much but what we could be taught something more. There are a great many of us who dislike to expose our ignorance by asking questions, which we ought, and are supposed to know. Now, by having these discussions, we may have the very things which we most desire to know explained to us without exposing our ignorance to anyone. We should all work together and strive to bring our trade up to a high standard. I am afraid we are neglecting one of our most important duties in not educating ourselves in the theory as well as the practice of our profession. It seems to be the prevailing evil of our business to learn some one particular branch, expecting to go through life knowing nothing else, and seeming to care less, instead of trying to master all the details, and not give up, simply because it seems a little hard to understand. Keep on trying; patience and perseverance will accomplish wonders. There are a great many of us who seem to have very little ambition to rise above our present station in life. We should all bear in mind that we must start at the bottom of the ladder before we reach the top. Now, let me again urge upon our brethern the necessity of educating ourselves, and becoming better posted in the various branches of our trade.

May 1893

INDIANAPOLIS, IND.

May 3, 1893.

Editor Electrical Worker:

Local No. 10, National Brotherhood Electrical Workers, met on the 1st, President S. B. French in the chair, with the rest of officers all present. There were two new lights added to the circuit with three more for the next meeting.

We are indebted to the Chicago Locals for a *scab list* that was sent to us, and I think it just the proper thing for each and every Union in the Brotherhood to do, as it is often the case that a workman that scabs soon gets out of a job and leaves for some other town, gets a job and goes right into the Union, merely to get work, whereas if we had a list we could refer to it and bring them to task. A man that will scab once will scab twice, and the quicker you expose him the better for ourselves.

The wiremen of No. 10 were granted a slight increase in wages and shorter hours and Union men rule.

We lost a man some time ago and can find no trace of him anywhere, though I think he is in St. Louis. His name is Little Willie Beaver. He weighs about 250 pounds, is about 6 feet 6 inches high, and if he is not known in St. Louis he ought to be.

Brother Alex. Hall was reported sick. Nothing serious, though.

Work is slow about opening up, but all Union men are busy. The prospect is good for a busy time coming, on account of Grand Army Encampment.

Brother Ed Hartung has been in the Fluid-Lightening business long enough it seems, and there are rumors of his going into the Lightening-Fluid busines later on.

Meeting adjourned to meet on Monday evening, May 8. Visiting brothers welcome.

D. A. GREENWOOD,
Press Sec.

EVANSVILLE, IND.

May 12, 1893.

Editor Electrical Worker:

Meetings of month of May were called to order as usual with a good attendance. The boys all turned out May-day and they made a grand display. Bro. S. Riggs, who is employed with the street railroad, met with an accident. He was at work on the line with Bro. Masston Martyne, on a tower wagon pulling up a span wire, when it gave way and threw him to the ground, about 25 feet. He was carried home and is now resting very easy. No bones were broken, and he will be ready for work in a few days. I had a fall myself about three weeks ago; I fell from an arc pole about 25 feet on a soft, white stone pavement. I was unconscious for half an hour, but was ready for work in three weeks. Indian is sick in bed. I suppose everybody knows who I mean by Indian. It is Bill Martyne. Bro. H. P. Hill, who has gone to contracting, is doing a very good business. The street railroad will build an extension to Howell's Station, about four miles, providing they get the right-of-way. If they do, there will be a great deal of work. Things are very slack at present and several boys are out of work.

The Union is progressing well.

Wishing The ELECTRICAL WORKER the greatest of success, I am yours fraternally,

WM. H. ERNST,
Press Sec.

CINCINNATI.

May 14, 1893.

Editor Electrical Worker:

Our little difficulty which started over a month ago is not yet settled. The outlook is favorable, however, and with assistance from the Brotherhood we will come out of the fight with flying colors. For the benefit of our brethren in other cities who may not have heard of the trouble, I will give a brief statement of the case. The Cincinnati Edison plant was finished last summer, and under the able management of J. A. Cabot (who is now City Electrician) everything went smoothly and the company furnished first-class service to its patrons. Recently a change of management took place and the company purchased the Queen City plant, and by some strange fatality there was a certain Mr. Davis attached to it. Mr. Davis, whose knowledge of electricity was acquired in that rat-hole on Longworth Street, seemed to get a sudden enlargement of the cranium when he took charge of the new Edison plant, and just to show his authority, started a crusade against the union employes, anyone of whom could teach him how to run a station. The men were told that they would either have to give up their union or get discharged. After a large number were discharged, the remainder quit work, as they knew that it would be only a few days until they would have to walk the plank. Mr. Davis was arrested on a warrant sworn out by Bro. A. J. Roberts, charged with violating the State law, which makes it a misdemeanor to discharge a man because he belongs to a labor organization. Davis was found guilty, although he had ex-Gov. Foraker to defend him, and fined $100 and costs. The company, although making a pretense to run the station, have done no work since the difficulty began. Anyone who knows anything about central station work, particularly so when operated on the underground system, knows that even with skilled and reliable men in constant attendance trouble constantly occurs, and what can be expected when a lot of hayseeds are suddenly put in charge, and as usual the locked-out union men are blamed for all the trouble. Several of the men have been arrested for alleged tampering with the wires, but nothing was proven against them, and rumor has it that Supt. Davis knew in advance where the tampering was to be done and who was to do it. It is said that he was the authority for the double column sensational article which appeared in a morning paper. If so, he has missed his vocation, for as an author of imaginary impossibilities, he would outrank Jules Verne and Rider Haggard combined. Let us see, how did that story run? If a short circuit happened on two wires in a building it would cause an armature (which would take weeks of time and thousands of dollars to repair) would burn out in the station. This would relieve the engine of its load, which in turn would run wild, causing the fly-wheel to burst into fragments, carrying death and destruction over the city! What a miraculous escape Cincinnati had! And yet we are sorry to say that a reputable Chicago electrical paper copied this bosh.

Bro. Clay Weeks, our genial President, who was one of the locked-out men, has charge of the dynamos at the new City Hall.

Bro. Frank Thomas, who was foreman in charge of the Edison underground construction, is enjoying a forced vacation. Never mind, Thomas, there is a good time coming.

Bro. H. D. W. Glenn is at the Insane Asylum—we mean manipulating lighting there.

K.

CLEVELAND.

May 8, 1893.

Editor Electrical Worker:

No. 16 is progressing steadily, and from the active interest being displayed by the majority of our members, we soon hope to be able to show some signs of our progress. All our men are working, in fact, most of our officers have been so busy during the past month, several have had to resign and a new staff elected. In regard to an inquiry about the Steel Motor Company of this city, I would not advise any brother to secure work there, as their preferences are for scab labor; in fact, the majority of them here are inclined the same way; but the above-mentioned company is notorious for the small wages paid and the disadvantages under which the men work. The Brush Company is doing a rushing business, especially in World's Fair work, and our members in that shop have to put in long hours until the rush is over, while we are deprived of their presence at our meetings. The Elliott Company reports business continually increasing to such an extent that new quarters will soon have to be secured, and a large shop is soon to be constructed, they having closed some large contracts. Since the consolidation of our street car lines, all our men in that branch of the business are rushed to their utmost, and will be for a long time to come.

The City Council has passed an ordinance for the construction of about ten or fifteen miles of railway, but the franchises have not as yet been awarded. A street railway of about six miles in length, controlled by the Cable Company, but at present using horse cars, are going to equip their road with the Short Electric System this spring, and from the amount of work contemplated, business appears as if it will be very good this summer. The Cleveland Electric Railway Company's new power house will be a very large building and will undoubtedly surpass anything of the kind in this part of the country, it having a capacity of 100,000 incandescent, 2000 arc lights and 1000 horse-power for the running of cars. When completed and in working order the houses along the line will be furnished with electricity for lighting' heating and cooking purposes. Hoping my communication will not arrive too late,

I remain, yours, etc., H. DUFF.

DETROIT, MICHIGAN, No. 17.

Brother John Walker has been receiving the congratulations of his friends. It is a girl.

Brother Kinchsular returned to work on the 8th inst., after a three-weeks' attack of congestion of the lungs.

The first anniversary of No. 17 was celebrated on April 25 at the residence of Vice-President King, where a pleasant social party was held. Dancing and other amusements were indulged in until a late hour.

Talk of bribery and boodle in connection with the city's proposed electric light plant has been the principal topic of public conversation for some time, but no definite charges were made until April 25, when Mayor Pingree burst a bomb in the City Council by publicly charging W. H. Fitzgerald, manager of the Detroit Electric Light and Power Company, with attempting to bribe Alderman Protiva to vote against sustaining the Mayor's veto of the resolution instructing the Lighting Commission to advertise for bids for a municipal plant, and for a three-years' contract. He, Pingree, also displayed a roll of $200 in bills which he charged Fitzgerald with having paid Protiva as an installment of the $1000 promised for his vote in the matter. The result of it all was that Fitzgerald spent that night in the police station under arrest, and his trial, which was set for the 5th inst., was postponed one week, and a boodle committee appointed by the Council, has had a number of suspected aldermen on the rack to ascertain how far the boodle operations have extended. Although the committee's operations have been considerably hampered by technical points which have been raised, and little is known to have been accomplished, we are unable to say until after the trial, just what has really been unearthed by the Mayor and committee.

No. 17 has had its second experience in a strike, and has scored a second victory. Last September the union trimmers and linemen employed by the Detroit Electric Light and Power Company, struck, owing to the discharge of three trimmers, without cause. Ten days and the loss of about as many thousand dollars sufficed to bring the company to terms, and to give the union official recognition. This time the other branch of our trade (telephone) had an experience which will be a salutary lesson to the company, and taught them the truthfulness of that oft-repeated adage, "In union there's serength." Some weeks ago the telephone linemen of our union met and formulated their demands on the company for an increase of $5 per

MAY 1893

month for State linemen and 25 cents per day for city linemen, and appointed a committee to present their demands to their employers. The officers of the company absolutely refused to give any consideration whatever to any demands coming from a body of organized men. The matter was promptly reported to St. Louis and a member of the Executive Committee asked for. In response Brother Ellwood of Cleveland came here (being sent as a substitute for Brother Dunn), but he too was unable to adjust matters, the principal point being the unwillingness of the company to recognize the union. However, they were told by the men in plain language that they would be compelled to do so, and subsequent developments demonstrated that this was no idle threat. On the 3d inst. the men employed on city work assembled at the company's office in the morning, but refused to go to work until the matter was properly adjusted. The upshot of it was that the officers of the company met a committee of the men and the demands were granted, the union officially recognized and the men returned to work the following morning. The State linemen employed some distance from the city were expecting word to quit, when they, even those who were not members of the union would have laid down their tools, but the word they received was: "The battle has been fought and won." Since then we have had applications for membership from nearly all of those non-union men, who will be admitted in due time, and then the telephone company's employes, at least so far as the male portion of them go, will be thoroughly union. Even the "hello" girls have since made a move towards forming a union and asking for an advance in their wages, but little has yet been accomplished, as the advance was promptly made and the girls told that the company was averse to their organizing. REX.

KANSAS CITY, MO.

Editor Electrical Worker:

MAY 9, 1893.

No. 18 is moving along very nicely. We have added twelve new lights to our circuit within the last month and new applications come in every meeting. At our last meeting a very interesting discussion was held on the all important question of wages; a number of good speeches were made on the subject and a committee of five was appointed to draft a scale of wages and present them to all the companies in our circuit.

The Missouri and Kansas Telephone Company is building an exchange in Oklahoma City, O. T. Will use the Cook switch-board. The company is making preparations to replace all iron wire with copper in Kansas City this summer.

The Kansas City Elevated Electric Railroad claims to have the largest dynamo in the West. The company is to make new extensions to its lines during the summer.

Frank Green, employed by the Missouri and Kansas Telephone Company, is the inventor of a two-wire reel, a lay out and a receiving reel. Patent applied for. Brother Green is a member of No. 18.

Bro. C. G. Eberhardt, who has been laid up for seven months with a broken knee-cap, is able to be around once more.

Second Grand Vice-President F. J. Roth has a new electrical worker at his house—a nice baby boy.

Brother A. E. Snelling has made up his mind that single blessedness is no longer good for him; he has gone to Iowa and will return in a few days with his bride and will be at home to his friends in Kansas City, Kan.

Wishing THE ELECTRICAL WORKER success in all its undertakings. Fraternally yours,

W. H. FINCH, Press Sec.
Res. 412 Park ave., Kansas City, Mo.

NEW HAVEN, CONN.

May 8, 1893.

Editor Electrical Worker:

DEAR SIR—Since my last report to the journal everything is going on smoothiy. The boys attend the meetings fairly well; the only ones that we can kick about are the Western Union boys; they are always sure to be in on the late train meeting nights. There are a few of them that we did not get into our Union yet, but we will endeavor to make them unite with us after awhile. At our last meeting we declared the Vice-President's chair vacant, seeing he did not attend very regularly, and filled his place. The trustees are to bring in a full report at our next regular meeting. One of our brothers has been very sick for the past four weeks, but he is getting along very well now. He expects to be out in a few days. We paid him $5 a week sick benefits. We have a committee working now on a new set of by-laws, and expect to have them out pretty soon. Our delegates that attend the Trades Council meetings bring in a report regularly. Fraternally yours,

T. J. BRENNAN,
Press Sec.

ST. PAUL.

May 8, 1893.

Editor Electrical Worker:

DEAR SIR—Our President, Joe McAuley, is going to resign at the next meeting. The brothers are very sorry to lose him as President, as he is a good man in the right place. An election of officers was held at the last meeting, which resulted as foilows: Paul Prevo, Vice-President; B. Willie, Recording Secretary; A. Hawkinson, Foreman.

John Hollen, who has been sick for several weeks, is improving. We hope to see him get on his climbers pretty soon and keep the police patrol busy.

The Northwestern Gen. Electric Company is going to put in twelve miles of track at Ashland, Wis.

The St. Paul Gas and Electric Light Company are wiring the St. Paul Auditorium; they are putting in twenty-seven arc lamps.

Every union has a kicker. Ours in the form of Mickel Lanahan, who never forgets to make his kick. He is not happy unless he can find fault.

Bobby Molten tried to see how hard he could hit his finger with a hammer, which caused him much pain the last few days. You have to do better, Bobby.

Tom Murphy is the happy father of a little boy, whom we expect to see grow up to be a first-class climber.

We are very sorry to state that Bro. York's wife died the 25th of April. He has the sympathy of all the brothers. Yours as usual,

GUS. MACKLETT,
Press Sec.

MINNEAPOLIS, MINN.

Editor Electrical Worker:

MAY 7, 1893.

DEAR SIR—Local Union No. 24 holds its regular meetings the second and last Fridays in the month. At our last meeting we initiated two new members and received two applications for membership. Brother Davenport from St. Paul attended our last meeting. He spoke in praise of the union and the good it is doing in educating the electrical workers throughout the United States. Brother Rakeoff returned from Chicago, where he has been for the past eight months. He made quite a speech and told us all about the "World's Fair" City. The Committee on Entertainment was given until next meeting to collect the tickets and money from the brothers who have not paid up.

It keeps our President busy calling Brother Donahue to order. Brother Aune, one of our great orators, assured the brothers he would have our local by-laws ready by our next meeting. Brothers Burns and Anderson had quite a debate on the best way of working a telegraph line in wet weather. Bro. Anderson said a line that is suffering from bad escape may be worked much better for through business in bad weather by switching off the battery at the receiving end of the line and receiving only by the sending office current, because, if there are heavy escapes on the line the sending operator does not break all the current from the battery at the receiving end, thus leaving the receiving relay partially magnetized constantly, and consequently less sensitive to the small portion of current from the sender that reaches the receiving station; whereas, if the only current on the wire is that of the sender, the portion of his current that does reach the other end of the line comes clear and sharp. Mr. Editor, this city has a population of 200,000 inhabitants and one of the finest electric street car systems in the United States; but will say that St. Paul is headquarters for all the Eastern electric companys; that is why I have no electric news for you.

The Northwestern Telephone Company will want climbers in about two or three weeks.

The Spring Valley Investment and Electric Light and Power Co. incorporated; capital, $50,000.

Brother Mark Brenan would like to hear from his brother, Peter, last heard from three years ago on the C. B. & N. Tel. Any information will kindly be appreciated by his brother. Yours fraternally, TIMOTHY DWYER,
Press Sec.

WASHINGTON, D. C.

May 6, 1893.

Editor Electrical Worker:

At our meeting last evening it was proposed to add one more incandescent light to our circuit, which will be done probably at our next meeting.

Brother Gorman, with his little hatchet, is now out in the Maryland woods hacking locust trees down from beneath the Postal lines.

Brother Deffer would like to know what has become of Charles Cunningham. Charlie was a first-class little lineman and we feel confidant that some local has enrolled his name among its members.

Brother J. F. Sheridan has hung out his "shingle" as an electrical constructor. We wish you success, Frank, and hope you will not forget your union principles.

What is the matter with No. 44? Brother Sherman promised me while visiting here during the Inauguration that he would let us hear from No. 44 through the colums of THE ELECTRICAL WORKER. Harry, do not forget your promise; nearly every Union was heard from in the last issue, but No. 44 was one of the silent ones.

The union laboring people in this city and the proprietor of a large dry goods establishment have had a misunderstanding about the construction of the large new store on G street. It was at first understood that none but union men should be employed, but the contractor in charge has allowed anyone to work on the job and failed to live up to the contract. The union workmen deem such a person unworthy of dealing with and now will go out of their way to patronize some other store.

There was a very good article in the last issue of THE ELECTRICAL WORKER under the head of "Scheme of Clasification." It is something that should be acted upon at our next convention of delegates. At present each local union has the privilege of adopting its own apprentice system.

By next November I think the National Brotherhood Electrical Workers will be sufficiently strong to adopt a good apprentice system, embodying it in the Constitution and require all local unions to strictly comply with it.

Each press secretary should give an outline of the apprentice system adopted by his local union, and when our delegates meet in convention it will not be an entirely new subject to them. They will have a definite idea of what they really want, in justice to the young man learning the trade, to the journeyman who gives him the benefit of years of experience and to the man who gives employment to both of them.

As I am the one to propose the thing I will start it by giving the substance of the crude system

MAY 1893

adopted by No. 26. A young man sixteen years of age or over, may become a union apprentice by sending in an application, accompanied by a fee of one dollar. If accepted he is given an apprentice's working card, which entitles him to work as such on union jobs. This card is good for one month after date, and costs him ten cents, but does not entitle him to a seat in the union.

Of course a union journeyman is more liable to go out of his way to instruct and aid a union apprentice than a non-union man is. If the boy is over sixteen and has been working at the business, that time is deducted from the three years, and is stated on the working card how long he is obliged to work as an apprentice.

Only one apprentice is allowed in a shop employing four men or less than four. Only two are allowed in a shop employing eight or more men.

These are the principal points of our system and refer to inside men or wiremen. Our system does not affect young fellows who desire to become linemen; therefore I think it crude.

The Telephone Company of this town maketheir own "climbers." They employ a few first-class linemen who step all the poles and put on cross arms. If the foreman is stringing a wire he will hustle a lot of his groundmen up the steps to "tie in" the wire.

Of course the foreman can get along that way with a few experienced linemen, and he feels sure that he is saving money by not paying experienced men enough wages to induce them to remain with him. If he were to take a whole gang of *linemen* to string wire for one day he would then see that first-class men are the cheaper in the end. I have always found it to be the case from what little experience that I have had with the gangs.

After the groundman has acquired experience enough to use a strap and vise to pull slack out of wires on a pole, his wages may be increased to two dollars per day, provided the man has the nerve to "kick vigorously" for it.

This company pays only two dollars per day for linemen, and when a stranger lights here he does not stay long, as the Postal, Western Union and Electric Light Company seldom have work for more than their regular men. It can be said in truth and with credit to the management of these three companies that they pay linemen $2.50 per day and have good men.

In conclusion, I will say to all brother linemen who contemplate coming or stopping here to remain away. Yours fraternally,

W. W. GILBERT.

BALTIMORE.

May 8, 1893.

Editor Electrical Worker:

Local Union No. 27 is doing admirably well. We are taking in new members at nearly every meeting. It seems that the men in Baltimore have condescended to think that there is something in the National Brotherhood Electrical Workers besides a name. I do not think the time is very far off when our city will be thoroughly organized. We are working for this end and we hope our efforts will be crowned with success. At present all our boys are at work and there is a demand for "climbers," who understand electrical work.

There will be in the neighborhood of 100 miles of electric railway started this summer on the several different roads that are at present propelled by the jaded horse.

We expected to have Brother Miller with us at our last meeting, but he failed to materialize and we were greatly disappointed, as a good, solid talk from one of our officers would have the effect of stirring the boys up somewhat, which would do them no harm.

It affords great pleasure to note the progres the journal has made in the few short months it has been in existence. All connected with the compilation of the paper deserve the highest commendation for their untiring zeal and earnest efforts to bring our paper to the front where it can rank with any electrical paper now before the public. Wishing you an increased success until we can proudly say we have the best electrical paper published in the United States, I remain yours truly,

L. R. WILCOX,
Press Sec.

PHILADELPHIA.

May 9, 1893.

Editor Electrical Worker:

Regular meeting of Local 28 was held on Tuesday, May 2. President Feeney held the chair, having been elected at the previous meeting to fill out an unexpired term. Our meeting place is called Morning Star Hall, Ninth street, above Callowhill street, held on first and third Tuesdays of each month. Our meetings of late are not attended as well as they should be, but it is to be hoped the boys will show up better in the future. Rumor reports that the Bell Telephone Company has purchased property in the neighborhood of Front and Berks streets, to make an up town station.

The Electrical Bureau of this city are busy laying underground conduits. They have taken down a number of overhead wires on South Broad street, having wires in that section working "out of sight."

By the shutting up of pool rooms in New York City, the Western Union loses $2,250,000 per year.

The following brothers were successful applicants for position as city linemen: Archy MacDonald, D. McDougal. All others got it where the chicken got the ax.

We read in the papers of an elevated electric railroad in full operation in Baltimore.

Bro. Billy Appleton met with serious injuries by falling from a pole in Trenton. We look for his speedy recovery.

Local Union No. 28 expects to give a grand river excursion this summer. It will be settled definitely in the course of next month. Whoop it up, boys!

New rules never nap while chasing trouble. O. K. will then pound your ear. I will close now with this ad:

WANTED—A Council for Philadelphia who will advocate rapid transit.

P. S. News is scarce, but to fill in I submit the following. Yours fraternally,

N. GILBERT,
North Wales, Mont Co., Pa.,
Press Sec.

THE WAGE QUESTION.

Taking into consideration the danger attached to linemen's work, they are poorly paid; they leave home and family in the morning in perfect use of their limbs and faculties, and it sometimes happens that the most careful man meets with serious accident. All of us know of such cases, not many, perhaps, but enough to attest to the dangers of our calling; and what remuneration do we receive? The best paid amounts to a paltry $2.50 per day; $3 would be little enough to pay for the wear and tear on the inner as well as the outer man. The question of wearing apparel is no small item to a lineman. Without us what would business do? It would come to a standstill. That has been proven in large cities when heavy storms have visited them, and telegraphic communication has been cut off from all points; then men are scarce and $3 is given readily, but the only way linemen in the East will receive the above amount is by thorough organization, and I don't think it will be such a great while before a capable man will be able to demand $3 per day; for, since the electrical workers have become established, it has been the means of producing ideas from its members that prove "they are no small bunch of horse radish. Yours,

PHILLY.

PATERSON.

May 5, 1893.

Editor Electrical Worker:

Local 32 has changed its place of meeting again and we met in our new hall for the first time Monday evening, May 1. Our regular meeting nights are the first and third Mondays of each month at German Union Hall, No. 35 Market street, and all brothers are cordially invited to pay us a visit if they have occasion to come to our city.

The Police Commission has instructed their clerk to communicate with other cities in relation to what system of police telegraph they have in use, so it is expected we will have a police telegraph system here in the near future.

Local 32 has decided to have an afternoon and evening picnic to be held at Saal's Haledon Park, Saturday, July 15, and we expect to make this one of the most enjoyable picnics of the season. The Committee of Arrangements are Jas McGuire, E. J. Clancy, Thomas McAndrew, John Deemond and Joseph Maher.

At this writing there is trouble in this district. Local Union 34, of Brooklyn, is out on a strike for an increase of wages and also Local 31 has joined them. So all brothers will keep away from Brooklyn, Jersey City, Newark and Paterson.

Fraternally yours, E. J. CLANCY,
Press Sec.

ALBANY.

May 9, 1893.

Editor Electrical Worker:

DEAR SIR—Local Union No. 38 met as usual last Thursday evening, President M. J. Cellery in the chair, also Vice-President J. R. Carlton. All officers were present with the exception of one trustee. All members were present except those who were out of town. Everything is looking well here. At our last meeting we initiated four new members. All brothers are welcome to call at our meetings. I remain yours fraternally,

C. S. HAMMOND,
Press Sec.

ST. JOSEPH, MO.

Editor Electrical Worker:

MAY 9, 1893.

The boys of No. 40 were highly pleased with the appearance of Bros. Wm. Luce and J. W. Mann at our last meeting. They have lately returned from their trip to Mexico with the Mexican Telephone Co. They report having had a very good time with the natives and say that the fair sex of that country are endowed with the greatest social attainments imaginable, which, of course, was very agreeable to the boys from the land of the free. The boys would advise any of our brothers before going to that country, to go under legal contract, by which the laws of Mexico will make corporations carry out their agreement to the letter.

Companies in Mexico will make promises and fail to fulfill them when in their native land; and if the boys from the States violate the Mexican laws in the least manner they will be hastily put in custody and be kept waiting four or five months for trial.

The Missouri and Kansas Telephone Company has a force of men under the management of Bro. John Webb rebuilding toll line between St. Joseph and Atchison.

Bro. Charles Waller, foreman of the city electric light plant, will begin operations on putting in a new circuit of about forty lamps next week. Bro. Gabe Maloy is one of the worthy men engaged for the work. This is a sure sign that union wages will be paid.

Mr. William Sutton of the Grand Island Railroad Company and Mrs. Winsch, of St. Joseph, have lately embarked on the sea of matrimony. The happy couple are located at Hanover, Kan. No. 40 joins me in extending hearty congratulations to our esteemed brother. Cigars are now in order.

Leavenworth is dead this month, Bro. P. W. O'Brien being sick with malarial fever.

H. T. SULLIVAN,
Postal Tel. Co., St. Joseph, Mo.

May 1893

ROCHESTER, N. Y.

May 8, 1893.

Editor Electrical Worker:

DEAR SIR—Having read your last issue and not seeing No. 44 represented in your columns, it made me feel as though we were not in existence. But I am sure you will be pleased to know that Local 44 is in existence and doing nicely. We have at present sixty-one members in good standing and numerous applications. The prospects for work in Rochester this season are bright. Work on the power-house of the Citizens' Electric Light and Power Company is progressing nicely. All the other electric companies here seem to be well supplied with work. We have been backward in appointing a press secretary, but will promise to have No. 44 represented in THE ELECTRICAL WORKER in the future.

Fraternally yours,

H. W. SHERMAN.

DIRECTORY OF LOCAL UNIONS.

(Secretaries will please furnish the necessary information to make this directory complete. Note that the *time* and *place* of meeting, the name of the President, the names and *address* of the Recording and Financial Secretary are required.)

No. 1, St. Louis, Mo.—Meets every Tuesday evening at 305½ Olive st. D. Lafferty, President; M. L. Purkey, Recording Secretary, 207½ N. Twelfth st.; John Hisserick, Financial Secretary, 315 Chestnut st.

No. 2, Milwaukee, Wis.—Meets 1st and 3d Wednesday at 526 Chestnut st. W. Denning, President; F. W. Smith, Recording Secretary, 377 Fifth st; E. Talbott, Financial Secretary, 315 Jackson street.

No. 3, New York, N. Y.—Meets every Thursday evening at Clarendon Hall, 114 E. Thirteenth st. Second and fourth Thursdays are devoted to lectures and instructions on practical electrical subjects. John P. McMahon, Pres.; Lester C. Hamlin, R. S., 542 East 17th st.; E. D. Leaycraft, F. S., 283 Flatbush ave, Brooklyn.

No. 4, New Orleans, La.—Meets 1st and 3d Wednesday at Odd Fellows' Hall. Wm. Moake, President; J. C. Bradley, Recording Secretary, Napoleon and Custom House sts.; J. J Vives, Fin. Sec., 173 S. Basin st.

No. 5, Nashville, Tenn.—A. H. Praugue, President; J. C. Bender, Recording Secretary, 817 N. Market st.; E. W. Morrison, Financial Secretary, 308 N. Summer st.

No. 6, Memphis, Tenn.—E. J. Gray, Secretary, 20 Goslee st.

No. 7, Springfield, Mass.—John Hoyt, President, F. Wyatt, Recording Secretary, Hotel Glenham; S. F. Cameron, Financial Secretary, 267 Main st.

No. 8, Toledo, O.—Meets every Thursday at 223 Summit st. James Carney, President; Michael Connors, Recording Secretary, 213 Everett st.; T. H. Nevitt, Financial Secretary, 1007 Bartlett st.

No. 9, Chicago, Ill.—Meets every Saturday at 199 E. Randolph st. G. W. Edison, President, Gus Sauers, Recording Secretary; J. H. Capps, Financial Secretary, 199 E. Randolph st.

No. 10, Indianapolis, Ind.—Meets every other Monday at 33½ S. Illinois st. Sam'l. B. French, President; L. E. Jones, Recording Secretary, 95 N. Meridian st.; C. W. Neal, Financial Secretary, 199 W. Maryland st.

No. 11, Terre Haute, Ind.—Meets every 2nd and 4th Tuesday at Washington Hall, cor. Eighth and Main sts. John Davis, President; Harry Bledsoe, Recording Secretary; Wm. C. Bledsoe, Financial Secretary, 424 S. Thirteenth st.

No. 12, Evansville, Ind.—Meets every Tuesday at Tenney Hall, Main st. R. Wright, President; Harry Fisher, Recording Secretary, 202 Clark st.; L. E. Wilke, Financial Secretary, box 266.

No. 13, Cincinnati, O.—Meets every Monday at Germania Hall, Vine st. J. C. Williams, President; J. B. Walker, Recording Secretary, 131 W. Ninth st.; H. D. W. Glenn, Financial Secretary, 27 Elizabeth st.

No. 14, Bridgeport, Conn.—C. F. Callahan, President, 173 Fairfield ave.; Ed Fagan, Jr., Recording Secretary, 78 Gregory st.; W. O. Kellogg, Financial Secretary, 160 Cannon ave.

No. 15, Worcester, Mass.—Chas. Cumming, Recording Secretary, 393 Main st.

No. 16, Cleveland, O.—Meets every Saturday at 94 Superior st. J. J. McGovern, President; N. Duff, Recording Secretary, 44 Wilson place; J. J. Jennings, Financial Secretary, 252 Washington st.

No. 17, Detroit, Mich.—Meets 1st and 3d Thursday at Trades' Councill Hall, 224 Randolph st. W. C. Shuart, President; I. B. Miller, Recording Secretary, 71 Henry st.; E. J. Lane, Financial Secretary, 705 15th st.

No. 18, Kansas City, Mo.—Meets every Friday evening at Industrial Hall, cor. Eleventh and Main sts. J. J. Jones, President; C. H. Adams, Recording Secretary, 215 W. Fourteenth st.; J. C. Tanpert, Financial Secretary, M. & K. Tele. Co., Sixth and Delaware sts.

No. 19, Pittsburg, Pa.—W. J. Condon, President, 4 Mansion st.; C. C. Logan, Recording Secretary, 210 Emerson st.; C. Murphy, Financial Secretary, 167 Second ave.

No. 20, New Haven, Conn.—S. R. Morrison, President; D. C. Wilson, 157 St. John st. Recording Secretary; J. Carter, Financial Secretary, 270 Hamilton st.

No. 21, Wheeling, W. Va.—C. L. Ullery, President, J. F. Bonnett, Recording Secretary, 2623 Jacob st. Wm. C. Prickett, Financial Secretary, box 111.

No. 22, Omaha, Neb.—Meets at Arcanium, Hall, 1314 Douglas st. J. J. Dooley, President, 1405 Jackson st.

No. 23, St. Paul, Minn.—Joe Macauley, President; Thos. Carey, Recording Secretary, 311 E. Thirteenth st. F. A. Zimmerman, 66 Douglass st., Financial Secretary.

No. 24, Minneapolis, Minn.—P. J. Fleming, President; W. Allen, 822 Eighth ave., S., Recording Secretary; Geo. Hulig, Financial Secretary, 25 Seventh st., south.

No. 25, Duluth, Minn.—S. J. Kennedy, President; Phil. Bellivere, Recording Secretary, Wieland Blk.; C. C. Miles, 28 Seventh ave., west., Financial Secretary.

No. 26, Washington, D. C.—Meets every Friday evening at K. of P. Hall, 425 Twelfth st., Nw.; R. F. Metzel, President; W. W. Gilbert, Recording Secretary, 941 Maryland ave. Sw.; P. A. Deffer, Financial Secretary, 941 Maryland ave. Sw.

No. 27, Baltimore, Md.—Meets ———. Fred Russell, President, 1408 Asquith st.; Wm. Manning, Recording Secretary, 1026 N. Front st.; J. W. Ebaugh, Financial Secretary, 107 N. Gay st.

No. 28, Philadelphia, Pa.—Meets ———. J. W. Fitzpatrick, President; H. B. Frazer, Recording Secretary, 1425 Vine st.; Thos. Flynn, Financial Secretary, 1116 Jackson st.

No. 29, Atlanta, Ga.—H. C. Bullis, President; J. R. Wellbern, Recording Secretary, 57 Butler st.

No. 30, Trenton, N. J.—S. L. Runkle, President, Trenton Electric Light and Power Co.; Ed. Anderson, Recording Secretary, Trenton Electric Light and Power Co.; Joe Harris, Financial Secretary, Trenton Electric Light and Power Co.

No. 31, Jersey City, N. J.—Thos. Watson, President; A. Richmond, Recording Secretary, 212 Wayne st.; John Speicher, Financial Secretary, 105 Newark ave.

No. 32, Paterson, N. J.—John Kane, President; Frank Areson, Recording Secretary, 214 Godwin st.; J W. Estler, Financial Secretary, 118 E. Thirty-Third st.

No. 33, Newark, N. J.—Meets every Monday evening at No. 58 Williams st.; Thos. Leahey, President; J. S. Stiff, Financial Secretary, 38 Elm st.; W. Whitehouse, Recording Secretary, 117 Quitman st.

No. 34, Brooklyn, N. Y.—T. J. Holihan, President; T. L. White, Recording Secretary, 363 Cumberland st; P. J. Dunn, Financial Secretary, 219 Adams st.

No. 35, Boston, Mass.—Meets 1st, 2d and 3d Wednesday and last Sunday, p. m., of each month. Ira M. Mosher, President; John H. Mahoney, Recording Secretary, No. 69 Essex st.; P. H. Dacey, Financial Secretary, 17 Hanson st.

No. 36, New York, N. Y.—Meets weekly at Ledwith Hall, Forty-fifth st. and Third av.; J. E. McGinty, President; L. L. Hall, Recording Secretary, 117 Leonard st.; John J. McDounell, Financial Secretary, 1632 Madison ave.

No. 37, Hartford, Conn.—Meets 1st and last Friday of each month at Central Union Labor Hall, 11 Central Row. Morris Cavanagh, President; J. T. Neville, 289 Allyn st., Recording Secretary; Geo. Dugan, Financial Secretary, 27 Affleck st.

No. 38, Albany, N. Y.—Meets the 1st and 3rd Thursday of each month. M. J. Cellery, President; John M. Wiltse, Recording Secretary, 22 Third st., E. Albany; Owen Dooney, Financial Secretary, 4 Rensaella st., Troy.

No. 39, Grand Rapids, Mich.—J. R. Watson, President; L. L. Henry, Recording Secretary, 97 Ottawa st.; Geo. Dierdorf, Financial Secretary, 723 Fifth ave.

No. 40, St. Joseph, Mo.—Meets every Saturday at Weidmeier & Wildburger's Hall, 623 Messanie st.; M. L. Durkin, President; M. S. Kerans, Recording Secretary, St. Joseph Electric Supply Co.; R. W. Stockwell, Financial Secretary, M. & K. Tel. Co.

No. 41, Chicago, Ill.—Meets every Wednesday at 116 Fifth ave. C. J. Edstrands, President; Chas. Osberg, Recording Secretary, 234 Townsend st.; Wm. Meacham, Financial Secretary, Crawford, Cook Co.

No. 42, Utica, N. Y.—Meets 2d and 4th Thursday at Trades' Assembly Hall, Bleeker st. W. B. McCoy, President; E. F. Allen, Recording Secretary, Columbia and Camelia st.; Harry Gordon, Financial Secretary, 512 Whiteboro st.

No. 43, Syracuse, N. Y.—Jas. Tyrell, President; A. D. Donovan, Recording Secretary, 305 Temple st.; Chas. Beattie, Financial Secretary, 217 N. Crouse ave.

No. 44, Rochester, N.Y.—W. Carroll, President; H. W. Sherman, Ninth and Rowe, Recording Secretary, J. Desmond, Western and North ave., Financial Secretary.

No. 45, Buffalo, N. Y.—E. Calvin, President; F. Hopkins, Recording Secretary, 77 Swan st.; H. L. Mack, Financial Secretary, 14 Mason st.

TAKE NOTICE

Officers of Local Unions should carefully read the following rules before writing for information:

1. Give notice at once when a change occurs in Secretary's address, or when a vacancy has been filled by the election of a new officer.
2. Consult the financial report in the WORKER every month, and if incorrect, report at once.
3. Arrange to receive any mail that may be *en route* to old addresses of officers, when change occurs.
4. In reporting the election of new officers, use the regular blank furnished for that purpose, and write plainly the *name* and *address* of each officer.
5. The monthly report of the financial secretary must accompany the dues sent.
6. Never fill out a report of any kind until first making it out on waste paper, then copy it on the regular report blank. This obviates alterations and scratching.
7. Always put name and *address* on reports and letters.
8. Send in name, number of card, age, and date of admission of each new member, as he will not be entitled to benefits until his name is enrolled on the books at the general office.
9. Report promptly the suspension or expulsion of members; also traveling cards taken out.
10. When sending money always state what the amount is for; do not leave it for the G. S.-T. to guess at.
11. All orders for supplies should be accompanied with the requisite amount of money.
12. Never send money in a letter. All remittances should be forwarded by post office money order, express money order or bank draft.

MAY 1893

13. Unions indebted for over two months' dues are non-beneficial (see Art. XV. Sec. 5). All members are interested in this matter and should look after it closely.
14. On the expiration of a traveling card the member holding said card should pay one month's dues and receive a due card and be enrolled as a member of the Union, the same as a new member.
15. All Local Treasurers should be under bond and the same filed with the G. S.-T.
16. All receipts and correspondence from the general office should be read at the meetings.
17. Read the constitution carefully and consult it on all matters that arise for consideration.
18. Make out all reports with ink and use the regular report blanks and letter paper furnished for that purpose.
19. When admitting or reinstating members the strictest inquiry as to health must be observed. If the member is married the wife's health must also be noted.
20. Claims for benefit must be filled out in every particular, and the law in regard to their presentation rigidly complied with.
21. No claims will be allowed unless the member is square on the books. Our beneficial system would cease to be an incentive for prompt payment of dues were this law not enforced.
22. Remittance of dues is not allowed under our Constitution. The amount of the dues must be deducted from the sick benefit paid by the Local. A member entitled to benefits can not get in arrears while receiving benefits. Members, by contribution, can keep the dues of a sick or unfortunate brother, not entitled to benefits, paid up.
23. Salaried officers must pay their dues and carry due cards. When salaries are due they must present their bill, and its payment passed on the same as any other bill presented to the Union.
24. Newly-elected officers must procure all blanks, documents, etc., from their predecessors.
25. Unions shall never assume to pay the funeral expenses of deceased members until first assured that the claim is allowable.
26. Preserve old due cards. They may be useful for reference in case of dispute over dues, etc.
27. Members should always when attending meetings of the Union have with them their Constitution and By-Laws; also their due cards.
28. Parties making statements in reference to recreant members will be held responsible for statements sent in for publication.
29. Matter for the ELECTRICAL WORKER must reach the general office by the 10th of each month.

As we are about to open a new roll book we request all Secretaries to furnish us soon as possible a complete roll of their members since their Union was organized. Some of the Unions with a membership of 100 to 200, according to the Financial Secretary's report, have less than twenty entered on the books at the general office, and none outside of those twenty would be entitled to death benefits.

Send in the name of every member initiated since the Union was organized, even though long since suspended or expelled. This is necessary, as we must have a correct record of every member who ever belonged to the Brotherhood.

RECORD OF PATENTS.

The following recent electrical patents are reported by Higdon & Higdon & Longan, patent lawyers, 215, 216 and 217 Odd Fellows' Building, St. Louis, and 48 Pacific Building, Washington, D. C.:

496,409, F. Hansen, Arc Lamp. Comprises a peculiar feed regulator in which the principal feature is a chain-wheel used in conjunction with the pivotal magnet and carrying a chain holding the carbon holders. Claims are clear and commensurate with the special novel mechanism.

496,449, Scribner & Warner, Perforated Pole Piece for Dynamos. Claims a machine having consequent pole-pieces cut-away or perforated on a line coincident with a plane passing through the axis of the armature shaft, such perforations being symmetrical with regard to said plane, whereby a uniform magnetic field is produced regardless of the direction of rotation of the armature.

496,522, David Mason, Controlling and Equalizing Electric Motors. Claims a method consisting in connecting the motors in series so that the coils of the different motors are cross-connected or entermingled, and then throwing the motors in multiple arc.

496,549, A. H. Wirsching, Printing Telegraph. Comprises numerous special features and constructive details. Claims are specific.

496,592, G. D. Burton, Working Brass by Electricity. Claims the method of working brass in a hot state consisting in subjecting the piece of brass to the action of a current until its interior core is raised to a temperature approximating fluidity, and maintaining the temperature of the exterior so far below that of the interior as to preserve its form and homogenous character and prevent the escape of volatized zinc; and then bending or shaping the pieces of brass into the desired form without breaking or destroying the skin thereof.

496,602, S. D. Field, Electric Signaling Apparatus. Relates to transmission of intelligible signals, especially speech, by electrical vibrations or undulations. One feature is the elimination of magnetic retardation arising from self-induction in ordinary electro-magnetic apparatus. Another, the prevention of mechanical retardation due to the intertia of moving parts. Comprises a conductor in a magnetic field in a state of stress that it may be thrown into vibration in accordance with the transmitted signals, and a conductor mechanically connected with an elastic diaphragm by which it may be thrown into vibration, or upon which it may reproduce vibrations. The field in which the conductor vibrates may be bi-polar or multipolar. Claims, broadly, a neutral or inharmonious vibrating agent, and a similar inductive circuit connected to said agent.

496,652, Hemingray & Gill, Telegraph Insulator. Claims an insulator provided with a series of teats at the lower edge of the insulator shield, to attract and gather at their points the drops of water running down the outside of the insulator.

496,690, H. F. Kolbe, Electric Alarm. Claims a vibratory armature of a bell, its actuating devices, an automatic locking latch for the armature, a releasing magnet, and a normally open circuit having two branches, one containing the actuating devices and the other the releasing magnet.

496,701, Sanders & Sanders, Electrode for Arc Lamps. Claims a carbon composed of a homogenous mass of carbon, a light-giving metalic salt, a reducing agent, and a binder.

496,702, Sanders & Sanders, Arc Lamp. Relates to a type of lamp in which the carbons are always in contact, and embodies special feafures specifically embraced in the claims.

496,786, J. W. Lattig, Electric Signaling Apparatus and System. Relates to an automatic electric Block Signaling System in which an electric motor is used to actuate the signal mechanism. Comprises, as essential features, a danger signal for each block, a track circuit therefor, a relay included in the track circuit, a motor circuit completed through contacts controlled by the track relay, and including an electric motor connected to and adapted to operate the danger signal, a caution signal, a primary circuit therefor, separate from the track and track circuits, including a relay, and completed through two sets of contacts, controlled, one by the danger signal mechanism of the same block, the other by similar mechanism of the succeeding advance block, and a motor circuit controlling the caution signal. Claims are restricted and limited to these features.

496,859, E. A. Clark, Transfer System for Telephone Switch-boards. Comprises a special and novel arrangement of electro-mechanical devices for transferring the connections from one section to another. The claims include numerous restricted elements and are, therefore, limited.

496,871, O. Ericsson, Electric Meter. Claims, broadly, a plurality of separate meters in corresponding separate circuits, and a single counting mechanism adapted to register the sum of current passing through all the meters. Embraces other more specific claims.

496,882, M. Kruegar, Arc Lamp. Relates to a tilting arc lamp for theatrical purposes. Novelty resides in constructive details. Claims are limited.

496,918, Elihu Thomson, Safety Connection for Induction Coil Systems. Aims to protect a person touching a conductor at the time accidentally in circuit with a high tension circuit. Comprises a high tension main line; a local circuit or conductor disconnected from the main line, but liable to receive current escaping from the main line; and a ground circuit or connection taken from a part of the local circuit normally disconnected from the main line, but containing a high resistance; and means to establish a substitute low resistance ground by the action of any escaping high tension current of the main line. Claims are fair.

497,025, R. M. Hunter, Electric Railway. From the claims, it appears that this patent covers broadly every existing overhead system, as claim covers the use of a sheaved trolley on a car, a suspended conductor, and a hand controlling switch for the motor.

497,038, J. Waring, Electric Incandescent Lamp. Utilizes a gas consisting of vapor of bromine, or of iodine, or a mixture of both, the atomic weight of these elements being high, and envelops the filament with such gas. Asserts that such a gas prevents "air washing" or disintegration, and does not carry away the heat from the filament. Claims are broad in scope.

497,110, P. A. N. Winand & C. O. C. Billberg, Multiphase Electric Motor. Claims an appliance for the employment of generation of multiphase alternating currents, consisting of a core wound with coils, the coils for the different phase currents being wound to overlap each other with diminishing magnetic effect.

497,113, O. T. Blathy, Transformer Motor. Claims two field magnets or groups thereof producing two magnetic fields independent of and not intersecting one another, and having their phases displaced relatively to each other; an armature having coils; a commutator and brushes in a closed circuit containing a resistance, the armature-coils being directly acted upon with an alternately inductive and dynamic action by the two field magnets, the fields of which pass through the armature at different points.

497,120, C. E. Chinnock, Electrical Circuit. Comprises a non-coiled shunt of high resistance to divert lightning from the generator without retardation through induction. Claim is broad.

497,123, M. W. Hassan, Commutator. Comprises a commutator of that type which is axially lengthened and is provided with segments spirally disposed around the same to give a large insulated interval between the segment without increasing the diameter of the commutator. The novelty resides in a series of brushes and brush-bars of peculiar construction. Claim is specific.

497,200, Nortney & Schefold, Electric Arc Lamp Support. Details of construction for raising and lowering the lamp, and structural arrangement of its support. Claims are specific.

497,263, W. P. Carstarphen, Electric Cigar Lighter. Designed for alternating currents and in a circuit, including a transformer. Comprises special details covered by specific claims.

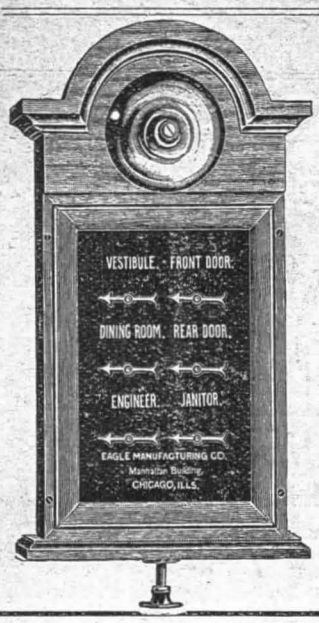
State of work in the Electrical Divisions in the U. S. Patent Office at this date:

Division of telegraphy, telephony, electric lighting and signalling is examinating applications filed March 2, 1893.

Departments of electricity, generation, distribution, etc., is examining applications filed October 10, 1892.

MAY 1893 P.A3

MAY 1893 P.A 4



ANNUNCIATORS

BELLS, PUSHES,

LETTER BOXES, ETC.

Eagle Manufacturing Co.,

Manhattan Building,

CHICAGO, ILL.

Or ask your dealer for the "EAGLE ANNUNCIATOR."

WORLD BEATERS!

That is the record of the

"STAR" JEANS PANTS,

MANUFACTURED BY THE

Loth Jeans Clothing Co.

We want every workingman in the City of St. Louis to know and appreciate this fact. You can't get along without them. Wearing qualities unsurpassed, and they won't rip.

Be sure the "Star" trade-mark is on every pair. For sale by

THE FAIR.

S. W. Corner 7th and Franklin Ave.

SHULTZ PATENT
Leather Woven Link Belt.

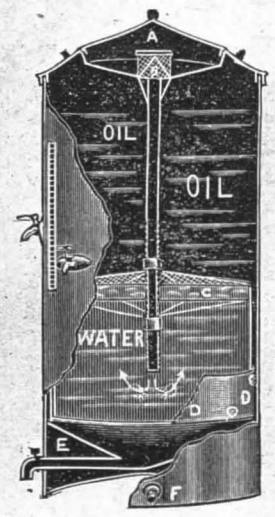
SHULTZ PATENT
Leather • Pulley • Covering.

SABLE RAWHIDE BELTING.

SEND FOR DESCRIPTIVE CIRCULARS.

ST. LOUIS, MO.

NEW YORK, N. Y., 225 Pearl St., A. B. LAURENCE, Manager.
BOSTON, MASS., 164 Summer St., GEO. T. KELLY, Manager.
PHILADELPHIA, PA., 129 N. 3d St., JAS. GARNETT, Manager.



Pat. July 28, 1891.

500 SOLD IN 18 MONTHS.

ACME OIL FILTERS!

The ACME is the cheapest, simplest, most durable and easiest operated practical Oil Filter in the market. Will be cheerfully sent on 30 days' trial, to be returned at our expense if our claims are not fully substantiated. For further particulars, prices, etc., address

ACME FILTER CO.,

730 N. Main St., St. Louis, Mo.

CHICAGO AGENTS:

TAYLOR, GOODHUE & AMES,

827 MONADNOCK BLOCK.

ARMATURES ——— **REWOUND.**

We make a specialty of repairing STREET RAILWAY Apparatus, large DYNAMOS, LAMPS, MOTORS and all kinds of ELECTRICAL MACHINERY. ARMATURES of any make re-wound. COMMUTATORS built and repaired.

QUICK WORK. REASONABLE PRICES.

McLEAN & SCHMITT,

195-199 S. Canal Street. CHICAGO.

ESTABLISHED 1867 — 125 SOUTH 2D STREET

PARTRICK & CARTER CO.

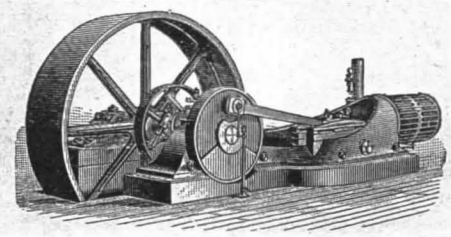
Electrical Supplies of all Kinds — *House Goods a Specialty*

WRITE FOR CATALOGUE — PHILADELPHIA

Werner Eng. Co.

WOOD PHOTO & HALF TONE ENGS

24 & 26 5TH 3RD ST. ST LOUIS.



A. M. MORSE & CO., ENGINES

OVER 3000 BUCKEYE RUNNING

COMPLETE POWER PLANTS, 50 TO 1000 H. P.

SIMPLE AND COMPOUND.

520 OLIVE ST. — ST. LOUIS.

Chicago Insulated Wire Co.,

MANUFACTURERS OF

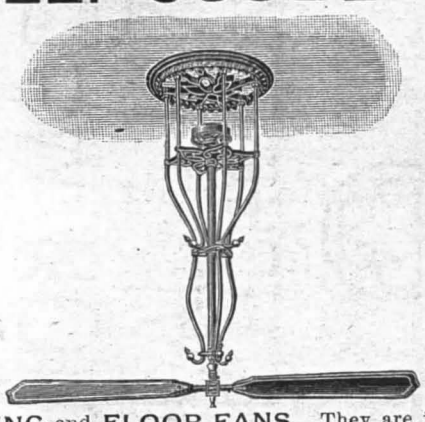
INSULATED WIRES OF ALL KINDS.

214 Northern Office Building

CHICAGO.

- Weatherproof Wire.
- Water-Fire Proof Wire.
- Magnet Wire.
- Annunciator and Office Wire.
- Weatherproof Iron Wire.
- Bare Copper Wire.

Why Not **KEEP COOL** When You Can?



See our CEILING and FLOOR FANS. They are in operation now at our office. In appearance they are light, airy and handsome. They are strong because made of steel, and won't break like the cast iron frames. All the latest improvements in adjustment. For prices and discounts to agents, write or call and see us.

HOME NOVELTY MFG. CO.,

N. E. Cor. 10th and Walnut Sts. ST. LOUIS, MO.

GEO. J. PERCIVAL,

Consulting Electrical Engineer and Superintendent,

219 Mermod & Jaccard Bldg., ST. LOUIS, MO.

1893 May Index

New System for Electric Heating, A.....1893.05.06
Personal, brothers achieve success.....1893.05.08
Possibilities of Electricity, Prof. Dolbear of Tuft's College.....1893.05.05
Practical Rule for Determining the Direction of Currents for Dynamos.....1893.05.06
Prof. E. J. Houston, curious fact discovered by Tesla.....1893.05.06
Record of Patents, new electrical inventions.....1893.05.16
Relations between the Electrical and Insurance Interests.....1893.05.02
Sawyer-Mann defends right to manufacture incandescent bulbs.....1893.05.06
Something About Asbestos, used for many things electrical.....1893.05.06
Take Notice, directions to local union officers.....1893.05.15
Trade difficulties have been entirely too numerous.....1893.05.08
Trade Notes.....1893.05.09
Train Dispatching by Telephone.....1893.05.07
What is Electricity, *The Electrical Review*.....1893.05.07
Where Electrical Workers May Look for Work.....1893.05.09
Where Electricity Comes From.....1893.05.06